Review and Evaluation of the Eastern Scotian Shelf Integrated Management (ESSIM) Initiative

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2013

Canadian Technical Report of Fisheries and Aquatic Sciences 3025

Fisheries and Oceans Canada | Pêches et Océans Canada

Canada

Canadian Technical Report of Fisheries and Aquatic Sciences

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Cat. No. Fs 97-6/3025E ISSN 0706-6457

Correct citation for this publication: McCuaig, J., and Herbert, G. (Eds.). 2013. Review and Evaluation of the Eastern Scotian Shelf Integrated Management (ESSIM) Initiative. Can. Tech. Rep. Fish. Aquat. Sci. 3025: xii + 95p.

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The editors would like to acknowledge the contributions of the Evaluation Sub-Committee of the Eastern Scotian Shelf Integrated Management (ESSIM) Stakeholder Advisory Council (SAC). The Evaluation Sub-Committee worked directly with the Oceans and Coastal Management Division, Fisheries and Oceans Canada (Maritimes Region), to design and undertake the ESSIM review and evaluation process.

The Evaluation Sub-Committee membership was as follows:

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ABBREVIATIONS

ACAP	Atlantic Coastal Action Program
AIS	Automated Identification System
AOI	Area of Interest
ASFA	Aquatic Sciences and Fisheries Abstract
AZMP	Atlantic Zonal Monitoring Program
BIO	Bedford Institute of Oceanography
CCME	Canadian Council of Ministers of the Environment
CEAA	Canadian Environmental Assessment Agency
CEPI	Collaborative Environmental Planning Initiative
CCESD	Canadian Commissioner of the Environment and Sustainable Development
CFIA	Canadian Food Inspection Agency
CHS	Canadian Hydrographic Service
CNSOPB	Canada-Nova Scotia Offshore Petroleum Board
COIN	Coastal and Ocean Information Network
COOGER	Centre for Offshore Oil, Gas and Energy Research
CSAS	Canadian Science Advisory Secretariat
DFO	Fisheries and Oceans Canada
DPSIR	Driving Forces-Pressures-State-Impacts-Response
EAM	Ecosystem Approach to Management
EBSA	Ecologically and Biologically Significant Area
EC	Environment Canada
EEM	Environmental Effects Monitoring
EEZ	Exclusive Economic Zone
EIA	Environmental Impact Assessment
ENGO	Environmental Non-Government Organization
ESS	Ecologically Significant Species
ESSCP	Ecologically Significant Species and Community Properties
ESSIM	Eastern Scotian Shelf Integrated Management
FSRS	Fishermen and Scientists Research Society
GIS	Geographic Information System
ICOM	Integrated Coastal and Oceans Management
IFMP	Integrated Fisheries Management Plan
LEK	Local Ecological Knowledge
LOMA	Large Ocean Management Area
LRIT	Long Range Identification and Tracking
MAARS	Maritime Aboriginal Aquatic Resources Secretariat
MAPC	Maritime Aboriginal Peoples Council
MARPOL	International Convention for the Prevention of Pollution from Ships
MFU	Maritime Fishermen's Union
MOU	Memorandum of Understanding
MPA	Marine Protected Area
MSC	Marine Stewardship Council
MSOC	Marine Security Operations Centre
NAFO	Northwest Atlantic Fisheries Organisation

NCNS	Native Council of Nova Scotia
NCR	National Capital Region
OCMD	Oceans and Coastal Management Division
OEER	Offshore Energy Environmental Research Association
PERD	Program of Energy Research and Development
PON	Provincial Oceans Network
RCCOM	Regional Committee on Coastal and Ocean Management
RCCOM CC	Regional Committee on Coastal and Ocean Management Coordinating Committee
RCOM	Regional Committee on Oceans Management
REET	Regional Environmental Emergencies Team
SAC	Stakeholder Advisory Council
SARA	Species at Risk Act
SOSS	State of the Scotian Shelf
TC	Transport Canada
TOR	Terms of Reference
WWF	World Wildlife Fund

ABSTRACT

McCuaig, J., and Herbert, G. (Eds.). 2013. Review and Evaluation of the Eastern Scotian Shelf Integrated Management (ESSIM) Initiative. Can. Tech. Rep. Fish. Aquat. Sci. 3025: xii + 95p.

The Eastern Scotian Shelf Integrated Management (ESSIM) Initiative was the first integrated oceans management initiative with an offshore focus under Canada's *Oceans Act*. From 1998 to 2006, the main focus of the ESSIM Initiative was the development of an Integrated Ocean Management Plan to provide long-term direction and commitment for integrated, ecosystem-based and adaptive management of all marine activities in or affecting the Eastern Scotian Shelf. The resulting Plan was organized in terms of three over-arching goals of Collaborative Governance and Integrated Management, Sustainable Human Use, and Healthy Ecosystems. From 2006-2011, the focus of the ESSIM Initiative was on the implementation of the objectives and management strategies associated with the Plan's three goals.

This report presents the results of a comprehensive evaluation and review of the ESSIM Initiative. The main objectives of this evaluation and review are to assess the achievements and progress of the ESSIM Initiative in accordance with the goals of the Plan, review the lessons learned from the process, and provide recommendations for future integrated oceans management in the Maritime Provinces.

RÉSUMÉ

J. McCuaig et G. Herbert (éditeurs). 2013. Review and Evaluation of the Eastern Scotian Shelf Integrated Management Initiative (ESSIM). Rapp. tech. can. sci. halieut. aquat. 3025: xii + 95p.

L'initiative de gestion intégrée de l'est du plateau néo-écossais (GIEPNE) était la première initiative de gestion intégrée des océans visant les zones extracôtières en vertu de la *Loi sur les océans* du Canada. De 1998 à 2006, l'un des principaux objectifs de l'initiative de GIEPNE était l'élaboration d'un plan de gestion intégrée des océans en vue d'établir une orientation en long terme pour gérer de manière adaptée, intégrée et qui tient compte des écosystèmes toutes les activités marines dans la zone du plateau néo-écossais, ainsi que toutes celles pouvant avoir des répercussions sur cette zone. Le plan qui en a découlé comporte trois buts généraux, à savoir, gouvernance collaborative et gestion intégrée, utilisation durable par les humains, et écosystèmes sains. De 2006 à 2011, l'initiative visait essentiellement à mettre en œuvre les objectifs et les stratégies de gestion liés aux trois buts fixés dans le plan.

Ce rapport présente les résultats de l'évaluation exhaustive et de l'examen rigoureux de l'initiative de GIEPNE. Les principaux objectifs étaient d'évaluer les réalisations et les progrès de l'initiative de GIEPNE par rapport aux buts fixés dans le plan, de passer en revue les leçons apprises dans le cadre du processus et de formuler des recommandations pour les prochaines initiatives de gestion intégrée des océans dans les provinces maritimes.

EXECUTIVE SUMMARY

This report presents the results of a comprehensive evaluation and review of the Eastern Scotian Shelf Integrated Management (ESSIM) Initiative, one of Canada's first integrated oceans management initiatives under the *Oceans Act*.

Integrated management is the coordinated management between ocean regulators, sectors, and stakeholders of human activities in a management area, so that human-ecosystem and human-human interactions can be anticipated and, if necessary, supported, prevented, or mitigated. The aim of integrated management is to support sustainable economic activity while simultaneously conserving marine ecosystems through a collaborative governance structure. The *Oceans Act* (1996) sets out in law principles of oceans governance that apply to all federal authorities that have some form of oversight of the ocean, its resources, and users. The Act also sets out specific commitments to be led by the federal Minister of Fisheries and Oceans, in support of integrated oceans management and marine conservation.

The ESSIM Initiative was announced by the federal Minister of Fisheries and Oceans in December 1998. The ESSIM Initiative, led by the Oceans and Coastal Management Division, Fisheries and Oceans Canada (DFO) Maritimes Region, was Canada's first integrated oceans management initiative with an offshore focus. The Initiative was a response to the Sable Gully Conservation Strategy, which recommended that integrated management be applied to the offshore area of the Scotian Shelf that surrounds the unique Gully ecosystem (the largest submarine canyon in eastern North America). When Canada's Oceans Action Plan was released in 2005, DFO announced that it would be facilitating the integrated management of marine activities in five large ocean management areas (LOMAs) including the Eastern Scotian Shelf. The LOMAs were pilot management areas that would be used to develop capacity and experience with the implementation of integrated management.

From 1998 to 2006, the main focus of the ESSIM Initiative was the development of the Eastern Scotian Shelf Integrated Management Plan (Fisheries and Oceans Canada 2007). The ESSIM Plan is a multi-year, strategic-level plan including objectives and high-level management strategies that was intended to provide long-term direction and commitment for integrated, ecosystem-based and adaptive management of all marine activities in or affecting the Eastern Scotian Shelf. The ESSIM Plan is organized in terms of three over-arching goals of Collaborative Governance and Integrated Management, Sustainable Human Use, and Healthy Ecosystems.

From 2006 to 2011, the focus of the ESSIM Initiative was on the implementation of the objectives and management strategies in the ESSIM Plan, particularly those associated with the Collaborative Governance and Integrated Management goal. Two sector actions plans were also initiated: a Spatial Conservation Action Plan (led by an environmental non-governmental organization caucus) and a Fisheries Sector Framework Action Plan (co-led by industry and DFO). The ESSIM Initiative ended on May 23, 2012 at the final meeting of the ESSIM Stakeholder Advisory Council (SAC).

This evaluation and review of the ESSIM Initiative is structured according to the three major goals of the ESSIM Plan – Collaborative Governance and Integrated Management, Sustainable Human Use, and Healthy Ecosystems – and the objectives and management strategies associated with these goals.

The objectives of this report are:

- To assess the extent to which the ESSIM Plan's Collaborative Governance and Integrated Management objectives were achieved;
- To review the progress that was made towards the management strategies associated with the ESSIM Plan's Sustainable Human Use and Healthy Ecosystem objectives;
- To present lessons learned from the Initiative's more than ten years of experience; and
- To present suggestions for the next phase of integrated oceans management in the Maritimes Region.

During the planning and scoping phase for this report, it was determined that a formal evaluation, using indicators, was appropriate for the suite of objectives under the Collaborative Governance and Integrated Management goal. However, it was also determined that such a formal evaluation was not appropriate for the Sustainable Human Use and Healthy Ecosystems goals, largely due to issues around attribution and measurability of indicators and outcomes.

A formal evaluation of the extent to which the Collaborative Governance and Integrated Management objectives were achieved was completed using evaluation questions and outcome indicators. A list of evaluation questions and indicators was initially developed by consulting several key sources on the evaluation of integrated management initiatives, management effectiveness, and marine protected areas (Hockings et al. 2006, Intergovernmental Oceanographic Commission 2003, 2006, Pomeroy et al. 2004, Walmsley 2006a). An internal DFO framework for evaluating *Oceans Act* Marine Protected Area (MPA) management effectiveness and a specific evaluation for the Gully MPA were also consulted (Koropatnick et al. in prep.). The evaluation questions were then edited by the Evaluation Sub-Committee of the ESSIM SAC by considering their relevance, time-effectiveness, complexity, and credibility, as well as data availability. The evaluation was based on multiple sources of information, including a questionnaire that was distributed to members of the ESSIM SAC and participants of a series of ESSIM Forum workshops, and a facilitated workshop held for current and former members of the ESSIM SAC.

A review of actions or initiatives taken towards the management strategies associated with the Plan's Sustainable Human Use and Healthy Ecosystems objectives was also completed by drawing on individual sector reports that were prepared by members of the ESSIM SAC, a DFO synthesis of the sector reports, and an ESSIM SAC performance review that was completed in 2009.

Table 1 presents an assessment of the extent to which the Collaborative Governance and Integrated Management objectives were achieved based on the results of the evaluation. A scale of 1 to 5 was applied to portray the extent of achievement for each objective. A score of 1 reflects no achievement and a score of 5 reflects full achievement.

Table 1. Assessment of extent to which Collaborative Governance and Integrated Management objectives were achieved

Objective	Assessment	Comment
Collaborative structures and processes with adequate capacity, accessible to community members, are established	4/5	The ESSIM Collaborative planning model was fully implemented. New coordination mechanisms were established and stakeholder involvement was facilitated. The capacity and commitment of sectors varied. There was uncertainty about the role/mandate of the ESSIM SAC.
Appropriate legislation, policies, plans, and programs are in place; legal obligations and commitments are fulfilled	3/5	There is a multiplicity of legislation, policies, plans, and programs in place in the ESSIM area. Stakeholders were mostly satisfied with the content of the ESSIM Plan. The Plan was not endorsed by the Minister of Fisheries and Oceans.
Ocean users and regulators are compliant and accountable	No indicators	It was not possible to develop or assess indicators of compliance or accountability. ESSIM-specific frameworks for compliance promotion and performance monitoring, reporting, and assessment were not developed. However, sector-specific compliance and monitoring mechanisms are in place.
Ocean stewardship and best practices are implemented	2/5	Numerous relevant guidelines and best practices are in place in the ESSIM area. However, existing guidelines and best practices were not reviewed or improved/adapted directly through the ESSIM process.
Multi-sectoral resource use conflict is reduced	3/5	Agreed-on procedures and mechanisms for the resolution of conflicts were in place. The relationship building and informal communication that occurred with the functioning of the ESSIM SAC contributed to conflict avoidance. There was no formal, centralized mechanism in place to report resource use conflicts within the ESSIM area to the ESSIM SAC.
Natural and social science research is responsive to knowledge needs	4/5	Numerous scientific outputs were produced related to the ESSIM Initiative. Formal review processes are in place and the results of research have influenced management activities in the ESSIM area. An ESSIM Science working group was established but an ESSIM-specific research strategy was not developed.
Information management and communication are effective	3/5	Information on the ESSIM Initiative is accessible to stakeholders but the general public has a minimal level of understanding about the Initiative. ESSIM is one of the best known examples of integrated oceans management internationally.

The review of progress towards the management strategies associated with the ESSIM Initiative's Sustainable Human Use and Healthy Ecosystems objectives indicated that overall there was moderate to significant progress on some management strategies and limited progress on others. Generally speaking, most ESSIM sectors are continually undertaking activities and initiatives towards the objectives, many of which are linked to the overall mandates of the federal and provincial governments and the goals of some of the ESSIM sectors (e.g., communications,

fisheries, shipping). However, many of the management strategies that focused on the ESSIM area specifically, and which would have required targeted resources and multi-sectoral collaboration within the collaborative governance framework, were not pursued.

The lessons learned by implementing the ESSIM Initiative over the past ten years include the following:

- The boundaries of an integrated management initiative play a strong role in determining which sectors participate in the process.
- It is vital to use or develop governance mechanisms that allow for the full participation of civil society, communities, and NGOs.
- It is important that collaborative governance mechanisms, such as multi-stakeholder bodies, have a clearly written Terms of Reference that outlines the group's purpose, objectives, and accountability.
- The process of drafting an integrated management plan using a multi-stakeholder process is a tangible task with a common goal and can create momentum and enthusiasm for the integrated management initiative.
- The use of strategic objectives in an integrated management plan gives rise to challenges of accountability and evaluation since actions and initiatives may not be directly attributable to the implementation of the integrated management initiative but may still contribute to its strategic objectives.
- Political support of an integrated management plan is important to stakeholders. The perceived lack of support for an initiative can lead to a decline in enthusiasm and commitment to the process by stakeholders.
- The shift between the development of an integrated management plan and plan implementation can be difficult, particularly within the context of a strategic-level integrated management plan.
- Consensus-based decision making can work well with a multi-stakeholder body working towards a common goal, such as an integrated management plan. However, it is important to have an agreed-upon alternative decision making mechanism in place for when consensus cannot be reached. Furthermore, consensus-based decision making may not be the most effective method of decision making once overall goals and objectives have been agreed upon, particularly where much of the plan implementation is being undertaken by individual sectors or governments.
- Multi-stakeholder governance mechanisms are vital for both the cross-sectoral relationships that are developed and the informal communication that takes place between its members.
- Regular and effective public communication about the integrated management initiative is very important in order to build public and sectoral support for the initiative.
- Performance evaluation is an integral part of an integrated management initiative. A general plan for performance evaluation should be written into the integrated management plan. If possible, it is important to formulate agreed-upon, measurable indicators to use in performance evaluation early in the process.

Questionnaire and workshop participants articulated their ideas as to what integrated management should look like in the future. It was suggested that future efforts be informed by the lessons and experiences of the ESSIM Initiative and that a multi-stakeholder committee or

council should continue in some capacity. Other suggestions included that there be stronger links to multi-sectoral processes currently in place and that efforts should be targeted where tangible progress, however small, can be made. The importance of collaboration and information sharing between and among other integrated management initiatives was also noted.

The ESSIM Initiative was oftentimes cumbersome, time-consuming, and challenging for all involved and change on the water as a result of the Initiative is difficult to attribute in a direct way. In hindsight, many aspects of the Initiative could have been undertaken with more finesse and efficiency.

However, the ESSIM Initiative's integrated and collaborative approach was certainly a worthwhile exercise for both the governance infrastructure that was developed and the significant institutional learning that occurred. DFO Maritimes Region was in many ways pioneering the development of an integrated management plan and had to learn by doing. A number of other initiatives by DFO, other departments, and ESSIM sectors demonstrate important changes and advancements that can be directly or indirectly connected with this Initiative. The ESSIM Initiative also appears to have influenced and broadened the perspective of ocean managers and users. A high degree of collaboration and a sense of shared ownership was achieved resulting in the development of lasting relationships between and within sectors. Generally, the ESSIM Initiative was a worthwhile investment of time and money towards future collaboration between governments, sectors, and stakeholders on a range of oceans management issues.

As the ESSIM Initiative pilot project ends and integrated oceans management in the DFO Maritimes Region moves forward, efforts should be focused on clarifying a revised governance structure while advancing implementation of the management strategies suggested in the ESSIM Plan on a region-wide scale. It is hoped that the results of this evaluation and review can be used as a basis for planning for this transition.

1. INTRODUCTION

This report presents the results of a comprehensive evaluation and review of the Eastern Scotian Shelf Integrated Management (ESSIM) Initiative.

The objectives of the report are:

- To assess the extent to which the ESSIM Plan's Collaborative Governance and Integrated Management objectives were achieved;
- To review the progress that was made towards the management strategies associated with the ESSIM Plan's Sustainable Human Use and Healthy Ecosystem objectives;
- To present lessons learned from the Initiative's more than ten years of experience; and
- To present suggestions for the next phase of integrated oceans management in Fisheries and Oceans Canada's (DFO) Maritimes Region.

This report begins by describing the Eastern Scotian Shelf and Slope and presenting a brief history of the ESSIM Initiative. The Initiative is then situated within the "Policy and Operational Framework for Integrated Management of Estuarine, Coastal and Marine Environments in Canada" (Fisheries and Oceans Canada 2002a). The evaluation and review methodology is detailed in Section 2. Sections 3, 4, and 5 present the results of the evaluation and review according to the ESSIM Plan's three goals: Collaborative Governance and Integrated Management, Sustainable Human Use, and Healthy Ecosystems. The report is concluded in Section 6 with a description of lessons learned and suggestions for the next phase of integrated oceans management in DFO Maritimes Region.

1.1 The Eastern Scotian Shelf and Slope

The Eastern Scotian Shelf and Slope encompass approximately 325,000 square kilometres of area; an area more than six times the size of the adjacent province of Nova Scotia. The ESSIM Planning Area is bounded to the east by the Northwest Atlantic Fisheries Organization (NAFO) 3/4 Divisional boundary, to the west by the NAFO 4W/4X Sub-divisional boundary, to the north by the 12-nautical mile Territorial Sea limit offshore of the province of Nova Scotia, and to the south by the 200-nautical mile Exclusive Economic Zone of Canada (Figure 1).

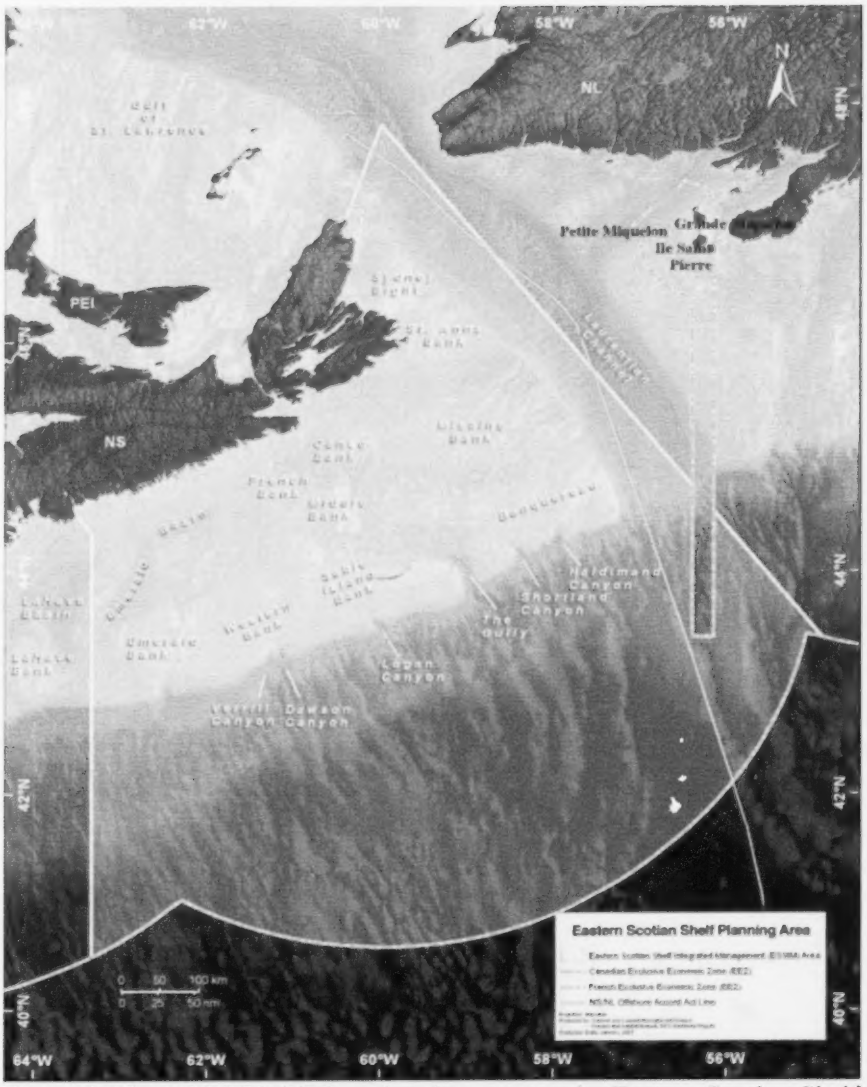

Figure 1. The ESSIM Initiative planning area on the Eastern Scotian Shelf and Slope located in the offshore of Nova Scotia. Source: Fisheries and Oceans Canada (2007).

The Eastern Scotian Shelf and Slope was selected for the ESSIM Initiative because of its important living and non-living marine resources, high biological diversity and productivity (including the Gully submarine canyon and Sable Island), and increase in human use of the ocean space within its boundary. While the area has traditionally been the domain of large fishing fleets, it now includes a wide range of ocean-related industries, including oil and gas exploration and development, telecommunications, shipping, tourism, marine recreation, scientific research and development, government marine operations, and conservation. The area also involves numerous administrative jurisdictions within two tiers of government. There are more than 30 regulatory institutions that have some form of legislated interest in the management of ocean resources in the ESSIM area.

1.2 Integrated Oceans Management in Canada

The marine environment is unique in that its largely accessible three-dimensional space and rapidly changing conditions can support multiple human activities in a given area over short periods of time. Management of these activities, however, remains largely divided amongst multiple authorities that have oversight over different ocean uses. In light of declining marine environmental quality and increasing conflicts between users, integrated management[1] has emerged as a solution to coordinate what has traditionally been a sector-based approach to oceans management in Canada. Integrated management is the coordinated management between ocean regulators, sectors, and stakeholders of human activities in a management area so that human-ecosystem and human-human interactions can be anticipated and, if necessary, coordinated and supported or mitigated and prevented. The aim of integrated management is to support sustainable economic activity while simultaneously conserving marine ecosystems through a collaborative governance structure. This is to be achieved on the basis of transparency, inclusiveness, and precaution.

Since it came into force in 1994, signatories of the Law of the Sea Convention have been obligated to demonstrate that they can effectively manage the resources within their Exclusive Economic Zones (EEZs). Canada's *Oceans Act* (1996) sets out in law principles of oceans governance that apply to all federal authorities that have some form of oversight of the ocean, its resources, and users. The Act also sets out specific commitments to be led by the federal Minister of Fisheries and Oceans in support of integrated oceans management and marine conservation. Three primary commitments outlined in the Act are: 1) develop a national strategy for managing Canada's oceans (Section 31); 2) establish a national network of Marine Protected Areas (MPAs) (Section 35); and 3) promote the integrated management of Canada's marine activities (Section 32). In the late 1990s, the Oceans Program was established by DFO to facilitate the advancement of these commitments.

In 2002, Canada released its national Oceans Strategy, which provides guidance on the management of Canada's oceans; founded on principles, concepts, and approaches characteristic of sustainability, precaution, and inclusiveness (Fisheries and Oceans Canada 2002a). The strategy is accompanied by the Policy and Operational Framework for Integrated Management of Estuarine, Coastal and Marine Environments in Canada, which outlines an operational framework in which to advance the integrated management of marine activities (Fisheries and Oceans Canada 2002b).

In 2005, Canada's Federal Marine Protected Areas Strategy was released, which sets a direction for building a national network of MPAs (Government of Canada 2005a). The strategy is supported by the establishment of MPAs throughout Canada, as well as more strategic conservation planning initiatives that are currently underway.

Canada's Oceans Action Plan was also released in 2005 as a federal multi-year, multi-sector plan (Government of Canada 2005b). In this plan, DFO announced that it would be facilitating the

[1] Integrated management has many names and is often referred to as integrated oceans management, integrated coastal and oceans management, integrated coastal zone management, integrated approach, and integrated management and planning.

integrated management of marine activities in five priority large ocean management areas (LOMAs). These were: the Pacific North Coast, the Beaufort Sea, the Gulf of St. Lawrence, Placentia Bay/Grand Banks, and the Eastern Scotian Shelf. The LOMAs were pilot management areas that would be used to develop capacity and experience with the implementation of integrated management. The pilot approach was intended to encourage practitioners to develop their own means to achieve integrated management, while employing the principles, concepts, and approaches outlined in the operational framework to achieve some level of national consistency.

In October 2011, DFO announced that it would be realigning its oceans management responsibilities by winding down the LOMA projects. The ESSIM Initiative ended on May 23, 2012 at the final meeting of the ESSIM Stakeholder Advisory Council (SAC). The Regional Committee on Coastal and Ocean Management (RCCOM), which evolved from a focus on the Eastern Scotian Shelf to a broader regional focus, will continue to operate.

1.3 The ESSIM Initiative

The ESSIM Initiative was announced by the federal Minister of Fisheries and Oceans in December 1998. The Initiative was a response to the Sable Gully Conservation Strategy, which recommended that integrated management be applied to the offshore area of the Scotian Shelf that surrounds the unique Gully ecosystem (the largest submarine canyon in eastern North America). The Initiative was Canada's first integrated oceans management initiative with an offshore focus.

Why focus on the offshore?

The offshore was chosen as the initial focus for the Plan for several reasons, including the desire to capture the area surrounding the Gully Marine Protected Area, which lies about 200 kilometres offshore, and the need to address increasing levels of multiple human use on the shelf and along the shelf break. Recognizing that the management needs and approaches for offshore differ in many ways from the inshore context – especially in terms of jurisdictions, use patterns, ecosystem characteristics and communities of interest – it was decided to first develop an offshore planning process. However, the longer term commitment to build complementary integrated management initiatives for coastal and inshore areas remains.

Source: ESSIM Plan

The ESSIM Initiative, led by the Oceans and Coastal Management Division (OCMD), DFO Maritimes Region, was intended to develop and apply the principles of integrated oceans management in one of Canada's more active marine areas. The three overarching goals of the ESSIM Initiative were: 1) Collaborative Governance and Integrated Management; 2) Sustainable Human Use; and 3) Healthy Ecosystems (Fisheries and Oceans Canada, 2007). A collaborative planning model approach was adopted for the ESSIM Initiative that had three main governance mechanisms: the broad-based ESSIM Forum, the SAC, and RCCOM.

From 1998 to 2006, the main focus of the ESSIM Initiative was the development of the Eastern Scotian Shelf Integrated Management Plan (Fisheries and Oceans Canada 2007). The ESSIM Plan is a multi-year, strategic-level plan including objectives and high-level management strategies intended to provide long-term direction and commitment for

integrated, ecosystem-based and adaptive management of all marine activities in or affecting the Eastern Scotian Shelf. The Plan was finalized in December 2006 when it was endorsed by the SAC and RCCOM. Although the SAC received a letter of support from the Minister of Fisheries and Oceans regarding implementation of the Plan's goals and objectives, the Plan was not formally endorsed by the Minister.

From 2006-2011, the focus of the ESSIM Initiative was on planning for the implementation of the ESSIM Plan and implementing some of the Plan's management strategies, particularly those associated with the Plan's Collaborative Governance and Integrated Management objectives. Two sector actions plans were also initiated: a Spatial Conservation Action Plan[2] (led by an environmental non-governmental agency (ENGO) Caucus) and a Fisheries Sector Framework Action Plan (co-led by industry and DFO).

1.4 Situating ESSIM within the Integrated Management Planning Process

Situating the ESSIM Initiative within the 2002 Policy and Operational Framework for Integrated Management of Estuarine, Coastal, and Marine Environments in Canada (Fisheries and Oceans Canada 2002b) provides the reader with important context for the current evaluation and review.

Table 2 describes the five stages that cover the lifespan of integrated coastal and oceans management (ICOM) initiatives in Canada and the associated timeline of the ESSIM Initiative. It is important to note that the framework as presented appears somewhat discrete and linear but actually reflects an iterative process that moves generally from stages one to five with significant looping back and around between each stage (Arbour 2009).

The Integrated Management Plan for the ESSIM Initiative was finalized in 2006 (Stage 3). The Plan was formally endorsed by decision-making authorities at the regional level through RCCOM, but did not receive a formal endorsement by the Minister of Fisheries and Oceans (Stage 4). Nonetheless, implementation in various forms began shortly thereafter (Stage 5),

[2]This included a gap analysis of how well existing closures, marine protected areas, and other measures met ESSIM ecosystem objectives.

Table 2. The ESSIM Initiative and the Policy and Operational Framework for Integrated Management of Estuarine, Coastal, and Marine Environments in Canada

Stage of ICOM	Description	Timeline	Notes
1. Defining and Assessing the Management Area	Involves identifying the ecosystems involved and defining relevant ecosystem-based management objectives. Includes scoping the issues and priorities that need to be addressed by the planning process, along with the interests and parties who need to be involved. Assessment of available information and knowledge, including scientific and traditional knowledge, is a prerequisite for providing a sound and logical basis for all other stages.	1998-2005	
2. Engaging Affected Interests	Participation by a diverse range of parties is required, because of their roles in decision making or with an interest or specific knowledge about the management area. This stage should also include the establishment of coordinating and governance mechanisms with representative management bodies, with agreed mandates, composition and rules of operation. The process of identifying roles, responsibilities, and commitments to action for stakeholders, both within and outside of government, is important.	1998-2006	Stakeholder participation continued after 2006, however, the main phase of establishing the collaborative governance structure ended when the ESSIM Plan was finalized.
3. Developing an Integrated Management Plan	The development of an integrated management plan requires consideration of numerous elements, including the following: • the defined area of application; • management structure and	2002-2006	The ESSIM Plan includes all of the listed elements except: • Monitoring and performance evaluation actions • Management actions

Stage of ICOM	Description	Timeline	Notes
	process; • management objectives for the area (ecosystem-based, social and economic); • recommended management actions including any conservation actions linked to the establishment of marine protected areas; • monitoring and performance evaluation actions; • institutional arrangements.		*Note: The plan does have management strategies.*
4. Endorsement of Plan by Decision-Making Authorities	All participants agree to carry out their respective responsibilities in accordance with the Plan. It is envisaged the Plan will need to be revised and endorsed by the responsible mandated authorities.	n/a	Plan received endorsement from federal and provincial departments in RCCOM but was not endorsed by the Minister of Fisheries and Oceans.
5. Implement the Integrated Management Plan	Key components of successful implementation are as follows: • leadership and facilitation by the overall coordinating body formed under the integrated management planning process; • adequate funding, time, and resource requirements identified for each phase of the plan; • appropriate reporting structures to ensure that plan objectives are met by participants, and that there is a high degree of compliance with the Plan; and • the participation of industry and the broader oceans community in the process.	2006-2012	Implementation of the Plan was undertaken in some areas. Not all key components of successful implementation were met.

2. METHODOLOGY

2.1 Why Evaluate?

Walmsley (2006a) presented reasons for evaluating programs and their activities, including:

- To assess progress and performance against set objectives;
- To promote accountability for those (persons or institutions) responsible for ensuring that actions take place;
- To improve effectiveness and efficiency; and
- To assist in making appropriate management decisions.

Specific to integrated management initiatives, the Policy and Operational Framework for Integrated Management of Estuarine, Coastal, and Marine Environments (Fisheries and Oceans Canada 2002b, p.32) stresses that regular review of integrated management plans is required to determine how well they are working and whether any significant new factors should be incorporated.

The 2005 Canadian Commissioner of the Environment and Sustainable Development (CCESD) parliamentary report on the performance of DFO in implementing the *Oceans Act* recommended that DFO measure, report, and account for its performance and the results achieved from its oceans management responsibilities and commitments; and provide this information to management and Parliament on a timely basis (Commissioner of the Environment and Sustainable Development 2005).

Although there has been some reporting on the status and progress of the ESSIM Initiative, this has not yet been done in the context of a formal performance assessment against its set objectives. There were two main drivers for undertaking a formal evaluation and review of the ESSIM Initiative. First, the ESSIM Initiative as a LOMA pilot project has now ended. As one of the intentions of the Initiative was to learn about integrated management by undertaking adaptive management (i.e., learning by doing), an evaluation of progress and a compilation of lessons learned by undertaking the Initiative is required to complete this learning. Second, the ESSIM Plan has been in place for five years and, according to the Plan, was scheduled for a full review.

2.2 Approach and Scope

The review and evaluation of the ESSIM Initiative is structured according to the three major goals of the ESSIM Plan: Collaborative Governance and Integrated Management, Sustainable Human Use, and Healthy Ecosystems. Although the Plan was not finalized until 2006, the three goals capture the overall intent of the ESSIM Initiative from its beginning and provide a suitable structure for the evaluation of the entire Initiative.

During the planning and scoping phase for this report, it was determined that a formal evaluation, using indicators, was appropriate for the suite of objectives under the Collaborative Governance and Integrated Management goal. However, it was also determined that such a

formal evaluation was not appropriate for the Sustainable Human Use and Healthy Ecosystems goals, largely due to issues around attribution and measurability of indicators and outcomes. Table 3 presents the general approach used to assess the three ESSIM goals. A formal evaluation of the extent to which the Collaborative Governance and Integrated Management goals were achieved was completed using evaluation questions and outcome indicators. A review of reported actions or initiatives taken towards the management strategies associated with the Plan's Sustainable Human Use and Healthy Ecosystems objectives was also completed.

Table 3. Approach to assessing ESSIM goals.

ESSIM Goal	Method	Purpose	Information Sources
Collaborative Governance and Integrated Management	**Evaluation** using evaluation questions and outcome indicators	Assessment of extent to which objectives were achieved	• Various reports/documents • Interviews with OCMD staff • Evaluation questionnaire • Evaluation workshop • Individual sector reports • Sector report synthesis • ESSIM SAC performance review
Sustainable Human Use	**Review** of reported actions taken towards objectives	Assessment of progress made on management strategies	• Individual sector reports • Sector report synthesis • ESSIM SAC performance review
Healthy Ecosystems	**Review** of reported actions taken towards objectives	Assessment of progress made on management strategies	• Individual sector reports • Sector report synthesis • ESSIM SAC performance review

The preliminary planning and scoping phase of the evaluation and review began in September, 2011. An Evaluation Sub-Committee of the ESSIM Stakeholder Advisory Council was struck in October 2011. An initial scoping document for the evaluation and review was also approved in October 2011.

The collaborative planning model is founded upon the following operating principles:

- ***Jurisdiction:*** Management authorities and jurisdiction of government departments and agencies are acknowledged and affirmed.
- ***Inclusion:*** All stakeholders are included.
- ***Consensus:*** Decisions and recommendations are made by consensus and the process includes mechanisms for dispute resolution.
- ***Accountability:*** Accountability is expected of and demonstrated by all parties.
- ***Evolution:*** The process is designed to permit and support evolution and will be monitored and evaluated to support shared learning and adaptation.
- ***Networking:*** The process will continue to work through a network of stakeholders.
- ***Transparency:*** Decisions and recommendations are made openly, with information and results shared with all stakeholders.
- ***Efficiency:*** Issues are addressed in a timely manner.
- ***Knowledge-based:*** Decisions and recommendations are based on best available information.

2.3 Evaluation

The first step in the evaluation of the Collaborative Governance and Integrated Management objectives was to develop a list of evaluation questions. The list of questions was initially developed by consulting several sources on the evaluation

of integrated management initiatives, management effectiveness, and marine protected areas (Intergovernmental Oceanographic Commission 2003, 2006; Hockings et al. 2006; National Oceanic and Atmospheric Administration 2007; Pomeroy et al. 2004; Walmsley 2006a). An internal DFO framework for evaluating *Oceans Act* MPA management effectiveness and a specific evaluation for the Gully MPA were also consulted (Koropatnick et al. *in prep.*). The evaluation questions were then edited by the ESSIM SAC Evaluation Sub-Committee by considering their relevance, time-effectiveness, complexity, and credibility as well as data availability[3].

One or more indicators were developed for each evaluation question. Indicators were meant to be simple, quantifiable, and communicable. The evaluation indicators were assessed using several information sources including the results of a questionnaire, the results of a workshop, pre-existing data such as reports, legislation, and meeting minutes, and interviews with OCMD staff members.

In November 2011, the ESSIM SAC Evaluation Sub-Committee developed a questionnaire based on some of the evaluation questions (Annex 1). The questionnaire was distributed to past and current members of the ESSIM SAC, participants in the ESSIM Forum workshops, and members of RCCOM in December, 2011. A total of 262 emails were sent. 252 emails were delivered successfully, 53 questionnaires were started, and 43 questionnaires were completed giving a response rate of 17%.

A workshop for current and former ESSIM SAC members was held on February 1-2, 2012 at the Bedford Institute of Oceanography, Dartmouth, Nova Scotia. The workshop was facilitated by a professional facilitator and evaluator, who compiled a report of the workshop's results. The ESSIM SAC Evaluation Sub-Committee provided input into the workshop's themes, which were based on a selection of the evaluation questions.

2.4 Review

The ESSIM Plan sets out a series of management strategies to achieve the Plan's objectives. The strategies were intended to represent a general course of action that would be pursued in order to reach one or more objectives. It was not envisioned that all of the strategies would be implemented within the first 5-year phase of the Plan, however, the strategies provide a reasonable structure for examining the extent to which the Sustainable Human Use and Healthy Ecosystems objectives were pursued.

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[3]There are several more evaluation questions associated with the first two Collaborative Governance and Integrated Management objectives than the rest (These are: *Collaborative structures and processes with adequate capacity, accessible to community members are established; Appropriate legislation, policies, plans and programs are in place*). More focus was placed on these objectives because: 1) the ESSIM Initiative has focused heavily on establishing governance mechanisms in its first years, 2) these objectives relate directly to the operating principles for collaborative planning (inset) which transcended all aspects of the ESSIM Initiative, and 3) members of the Evaluation Sub-Committee placed a high importance on evaluating these objectives.

The review was completed by drawing on individual sector reports that were prepared by members of the ESSIM SAC, a DFO synthesis of the sector reports, and an ESSIM SAC performance review that was completed in 2009. Fourteen sector reports were completed for twelve sectors, since some sectors preferred to produce more than one report to reflect inter-sectoral differences in governance and structure (e.g., there were two Aboriginal sector reports completed).

The following sector reports were completed:

- Aboriginal – Unama'ki Institute of Natural Resources
- Aboriginal – Maritime Aboriginal Peoples Council
- Communication – International Subsea Telecommunications Cables
- Coastal Communities
- Environmental Non-Governmental Organizations (ENGO)
- Federal Government – DFO
- Federal Government – Other Federal Partners (e.g., Environment Canada, Canadian Environmental Assessment Agency, Parks Canada, Transport Canada, Natural Resources Canada)
- Canada-Nova Scotia Offshore Petroleum Board
- Fisheries – Inshore
- Fisheries – Offshore[4]
- Municipalities[5]
- Provincial Government – Provincial Oceans Network
- Shipping

A representative selection of activities and initiatives contained in the sector reports were used to illustrate progress against Sustainable Human Use and Healthy Ecosystem objectives and management strategies.

2.5 Limitations

This evaluation and review has several limitations which should be noted prior to presenting the results.

First, the process of determining the evaluation questions and associated indicators was not ideal. Most of the guidance materials for conducting evaluations suggest that indicators for measuring the success or progress of an integrated management initiative should be developed at the same time the integrated management plan is being developed (Intergovernmental Oceanographic

[4]Industry representatives stated that the previously completed Fisheries Sector Framework Action Plan addressed this requirement and did not submit a sector report. However, DFO compiled a summary of offshore sector activities to complement the inshore sector report.

[5]A municipal report was submitted but does not provide information on sector-related activities due to a decision by the sector to remain as an "observer" to the process.

Commission 2006; Walmsley 2006a). In the case of the ESSIM Initiative, neither a framework for evaluation nor indicators were determined at that stage of the process[6].

Second, it would have been ideal to complete an evaluation of the extent to which the Sustainable Human Use and Healthy Ecosystem objectives were achieved using evaluation questions and outcome indicators as above. This was not possible due to time and resource limitations. Furthermore, it would be difficult to directly attribute the assessment of any particular outcome indicators for these objectives to the implementation of the ESSIM Plan[7].

Third, individual sector reports were the main source of information for the review of progress towards the Sustainable Human Use and Healthy Ecosystems objectives. Sector reports were not completed for all of the ESSIM sectors and not all of the reported actions and initiatives were included in the review. For example, several sector plans included actions and initiatives that did not pertain to the ESSIM area or did not specifically relate to the objectives. The sector reports were varied in their breadth and depth and some relevant actions and initiatives were potentially missing from the reports and are therefore not included in the review.

[6]Attempts were made to develop indicators for the objectives contained in the Plan. However, these were never finalized by the SAC and it was determined that the scope of the Plan would remain at higher, strategic level.
[7]The State of the Scotian Shelf theme papers do present indicators related to some aspects of the "health" of the ecosystem (see Annex 2)

3. COLLABORATIVE GOVERNANCE AND INTEGRATED MANAGEMENT

This section presents the results of the evaluation of progress made towards the ESSIM Plan's Collaborative Governance and Integrated Management objectives (Table 4). The section starts with a chronology of events related to the objectives. Then, the evaluation questions and assessed indicators are presented for each objective. The section concludes with an assessment of the extent to which the objectives were achieved.

Table 4. ESSIM Plan's Collaborative Governance and Integrated Management objectives

Element	Objective
Integrated Management	Collaborative structures and processes with adequate capacity, accessible to community members, are established.
	Appropriate legislation, policies, plans and programs are in place.
	Legal obligations and commitments are fulfilled.
	Ocean users and regulators are compliant and accountable.
	Ocean stewardship and best practices are implemented.
	Multi-sectoral resource use conflict is reduced.
Information and Knowledge	Natural and social science research is responsive to knowledge needs.
	Information management and communication are effective.
	Monitoring and reporting are effective and timely.

3.1 Chronology of Events

Following the announcement of the ESSIM Initiative in December 1998, the first major effort of OCMD was to engage the numerous regulators, sectors, and stakeholders with an interest in the planning area. Key stakeholders included: federal and provincial government agencies, municipal and local authorities, Aboriginal peoples, ocean industry sectors, special interest groups, academics, and the public at large. To encourage the participation of regulators, sectors, and stakeholders in the ESSIM process, OCMD undertook a series of informal, bilateral information and discussion sessions in 1999. The discussions were used to inform those with a stake in the ESSIM area about the *Oceans Act* and the concept of integrated management.

In December of 2000, the Nova Scotia Office of Intergovernmental Affairs facilitated a meeting between DFO and the provincial departments, agencies, and boards that have some form of mandate in the ESSIM area[8]. In January 2001, government coordination in support of ESSIM was formalized with the establishment of a Federal-Provincial ESSIM Working Group. The Group was used to advance the ESSIM Initiative at the working level in government. The working group consisted of representatives from more than 20 ocean-related federal and provincial government departments, agencies, and boards.

[8]Although the ESSIM Initiative had an offshore focus, it was recognized that the Government of Nova Scotia had a significant role to play in the development of an integrated management for the Eastern Scotian Shelf.

Following establishment of the Federal-Provincial Working Group, OCMD released a series of documents that helped focus the discussion and foster understanding of integrated management and what it could mean for the ESSIM area (Fisheries and Oceans Canada 2001a, 2001b, 2001c). The documents provided examples of integrated management being implemented elsewhere in the world, proposed a governance structure for the ESSIM planning process, and provided an overview of issues, challenges, and opportunities in oceans governance that could be addressed through the ESSIM Initiative.

The governance structure that was proposed for ESSIM consisted of: 1) a Regional Committee on Government Affairs; 2) a Federal-Provincial ESSIM Working Group; 3) an Ocean Management Planning Group; 4) the ESSIM Forum; and 5) the ESSIM Planning Office[9]. The structure recognized that for ESSIM to be successful it must be overseen by a committee of executive-level federal and provincial government officials that have some form of jurisdiction and authority over decisions made in the planning area[10]. The Federal-Provincial ESSIM Working Group and Ocean Management and Planning Group fell under the Regional Committee on Government Affairs. It was proposed that the Federal-Provincial ESSIM Working Group consist of intermediate-level federal and provincial government officials responsible for implementing integrated management at the working level in government, based on direction from the Regional Committee on Government Affairs. It was proposed that the Ocean Management and Planning Group consist of a select group of government officials, sector representatives of industry, and stakeholders that could advise government, as well as implement the ESSIM vision at the sector and stakeholder level.

It was also proposed that the ESSIM Forum consist of a variety of stakeholders that would involve a broad range of representation to ESSIM Initiative. Interaction with the Forum was to be facilitated through mailing lists, web-based communications, and general meetings. The ESSIM Planning Office, which was housed in OCMD and supported by DFO, was envisioned to facilitate the ESSIM process based on direction that it received from members of the ESSIM governance body.

In February 2002, the first general meeting of the ESSIM Forum was held to discuss the ESSIM Initiative, its proposed governance structure, and the issues, challenges, and opportunities that confronted ocean users of the ESSIM area. More than 150 participants attended the event (Coffen-Smout et al. 2002). Participant input provided direction on the development of a draft strategic planning framework for ESSIM, including the establishment of integrated management objectives and improved communications between the Forum and other parts of the governance structure. In April 2002, OCMD launched an ESSIM website that provided a two-way communication portal between government and the Forum[11]. By the end of 2002, the Federal-Provincial ESSIM Working Group and the ESSIM Forum had formally been established.

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[9] The name "ESSIM Planning Office" is no longer used. Recent documents related to the ESSIM Initiative refer to the Oceans and Coastal Management Division (OCMD).

[10] In Canada, decisions that support integrated management remain in the jurisdiction of the legally mandated authority, as the *Oceans Act* (or any other federal or provincial legislation) does not impart this authority to integrated management bodies.

[11] The ESSIM web site is located at: http://www.mar.dfo-mpo.gc.ca/e0010285

In January 2003, OCMD released a draft strategic planning framework that proposed a vision for advancing integrated management in the ESSIM area. The planning framework was vetted through the Federal-Provincial ESSIM Working Group and at the second ESSIM Forum workshop held in February 2003 (Fisheries and Oceans Canada 2003a; Rutherford et al. 2003).

In 2004, OCMD continued to engage the Federal-Provincial ESSIM Working Group, the ESSIM Forum, and a broader range of stakeholders to discuss and refine the vision for the ESSIM area (e.g., guiding principles and objectives), its governance structure, and mechanisms for consensus and conflict resolution (Fisheries and Oceans Canada 2004a; Millar et al. 2004; Fisheries and Oceans Canada 2005b). In February 2005, a draft plan for discussion was released and subsequently presented at the third ESSIM Forum workshop (Fisheries and Oceans Canada 2005a; Coffen-Smout et al. 2005). In October 2005, a Regional Committee on Oceans Management (RCOM) (originally proposed as the "Regional Committee on Government Affairs") was formally established. Subsequently, the RCOM broadened its scope to include coastal areas and the three Maritimes Provinces, and is now referred to as the Regional Committee on Coastal and Oceans Management, or RCCOM.

The RCCOM is a committee of executive-level government officials that represent federal and provincial government departments and agencies that have ocean-related authority in Nova Scotia, New Brunswick, and Prince Edward Island and their associated marine waters. The region of interest of the group extends beyond the ESSIM boundary. In this sense, RCCOM is not just an oversight body of ESSIM, but also extends its oversight throughout the Maritimes Provinces of Canada.

In addition to the RCCOM, the ESSIM SAC was formalized in 2005. It fulfilled the Ocean Management and Planning Group function of the proposed governance structure (Figure 2). The ESSIM SAC was a representative committee of regulators, sectors, and stakeholders with an interest in the ESSIM area. The membership was balanced by sector and interest, with changes in membership occurring on a staggered, rotational basis every two and three years. The role of SAC included: 1) to represent the views of the broad range of ESSIM stakeholders; 2) to provide leadership, guidance, and stewardship for development and implementation of the ESSIM vision; and 3) to engage in multi-stakeholder dialogue, conflict resolution, and consensus-building in the ESSIM area.

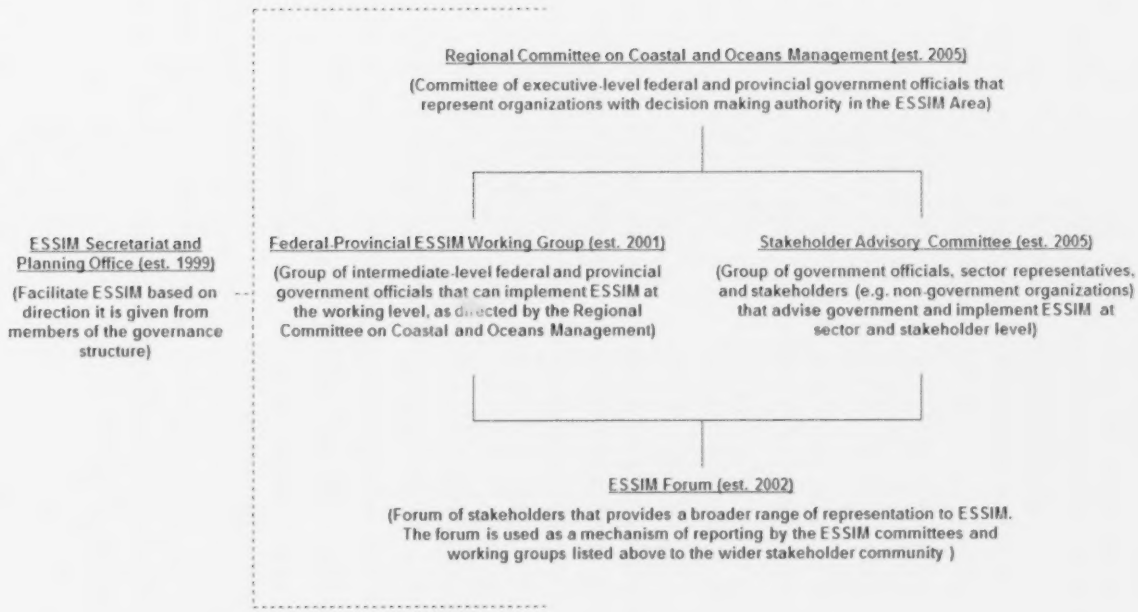
Regional Committee on Coastal and Oceans Management (est. 2005)
(Committee of executive-level federal and provincial government officials that represent organizations with decision making authority in the ESSIM Area)
ESSIM Secretariat and Planning Office (est. 1999)
(Facilitate ESSIM based on direction it is given from members of the governance structure)
Federal-Provincial ESSIM Working Group (est. 2001)
(Group of intermediate-level federal and provincial government officials that can implement ESSIM at the working level, as directed by the Regional Committee on Coastal and Oceans Management)
Stakeholder Advisory Committee (est. 2005)
(Group of government officials, sector representatives, and stakeholders (e.g. non-government organizations) that advise government and implement ESSIM at sector and stakeholder level)
ESSIM Forum (est. 2002)
(Forum of stakeholders that provides a broader range of representation to ESSIM. The forum is used as a mechanism of reporting by the ESSIM committees and working groups listed above to the wider stakeholder community)

Figure 2. ESSIM governance structure formalized by 2005.

Following formalization of the ESSIM governance structure, OCMD continued to work with the ESSIM committees and working groups to establish a common vision for managing the area. In January 2007, a strategic-level Integrated Management Plan for the ESSIM area was endorsed by all levels of the ESSIM governance structure, including the SAC and RCCOM (Fisheries and Oceans Canada 2007). The Plan set out a common vision, objectives, and guiding principles for ocean regulators, sectors, and stakeholders to abide by in their decisions and actions, in consideration of the ecosystem, ocean users, and others that have a stake in the ESSIM planning area. In November 2008, a fourth ESSIM Forum workshop was held to affirm the ESSIM Plan and to commence discussion on its implementation (MacLean et al. 2009a).

As part of the approval process under the *Oceans Act*, the SAC and RCCOM sent letters of endorsement for the ESSIM Plan to the Minister of Fisheries and Oceans in December 2007. These letters requested that the Minister formally approve or endorse the document as an Integrated Management Plan under Section 32 of the *Oceans Act*. In March 2008, the Minister provided a reply to SAC and RCCOM affirming commitment to the planning process but falling short of formal endorsement of the ESSIM Plan. The decision of the Minister to not formally endorse the Plan was due to a concern raised by the Government of Newfoundland and Labrador about the eastern boundary of the ESSIM planning area. This eastern boundary corresponds to the line dividing the North Atlantic Fishery Organization (NAFO) divisions 4V and 3P and also serves as the administrative boundary between the DFO Maritimes and Newfoundland and Labrador Regions. This administrative boundary is relatively close to the 2002 Tribunal line that separates the jurisdiction of the Canada-Nova Scotia and Canada-Newfoundland and Labrador Offshore Petroleum Boards for purposes of oil and gas development and regulation. The Government of Newfoundland and Labrador insisted that the ESSIM planning area be amended

to conform with the 2002 Tribunal line. Another letter was sent by the SAC in July 2010 to the Minister, requesting for a second time formal endorsement of the Plan. No response was received. In a separate letter to the Minister in September 2010, a sub-group of SAC stakeholders, including ENGOs, Aboriginal organizations, inshore fishermen's associations, and community groups wrote to request endorsement of the Plan, as well as recognition of the SAC as a formal advisory body to the Minister under Section 32 of the *Oceans Act*. This was followed in October 2010 by a letter to the Minister from the SAC co-chairs on behalf of all members requesting formal endorsement of the Plan, although the request for the formal recognition of the SAC itself was not included this time.

It is important to point out that in August 2010, the Minister had written a letter of endorsement for the Integrated Management Plan for the Beaufort Sea, an initiative that started well after the ESSIM Initiative. This can be attributed in part to a growing interest on the part of the current federal government in the north where sovereignty and potential development issues related to the opening up of the Northwest Passage as a result of climate change were being raised.

It is important to record these letters as they speak to the heart of a significant governance design issue for the ESSIM Initiative and any future integrated management initiatives. On two occasions, SAC members, including the co-chairs, met with the Deputy Minister and Assistant Deputy Minister of DFO to discuss issues related to Ministerial endorsement. While this was an indication that senior officials were taking the matter seriously, it did not lead to a resolution. It is also important to note that there was a change in government over the life of the ESSIM Initiative and four different Ministers were involved. This observation is important in determining the pace of implementation for future initiatives.

The failure to receive formal endorsement of the Plan has been identified as an over-riding reason for the subsequent lack of progress in implementation, as well as the dwindling level of support and recognition of the ESSIM Initiative.

As mentioned above, in October 2011, DFO announced that the Department would be realigning its oceans management responsibilities by winding down LOMA projects and applying integrated oceans management approaches as part of DFO's regular operations.

3.2 Evaluation

The following sections are sub-divided according to the Collaborative Governance and Integrated Management objectives of the ESSIM Plan. Each section presents the evaluation questions and assessed indicators, as well as examples of actions and initiatives taken towards the objectives by the ESSIM sectors.

3.2.1 Collaborative structures and processes with adequate capacity, accessible to community members, are established

The main mechanism used to achieve integrated management and develop and implement the ESSIM Plan is collaborative governance. According to the ESSIM Plan, in order for

collaborative governance to be effective, appropriate structures and processes must be established and all interested parties must have the ability to participate.

A total of 18 evaluation questions were used to assess the extent to which the objective "Collaborative structures and processes with adequate capacity, accessible to community members, are established" was achieved. Due to the high number of evaluation questions, they have been grouped into five themes: coordinating bodies, stakeholder involvement, capacity and interest, collaboration and decision making, and leadership and commitment.

Coordinating Bodies

Table 5. Evaluation questions and indicators for theme "Coordinating Bodies"

Evaluation Question	Indicator(s)	Assessment	Data Sources
Were there coordinating bodies for the ESSIM Initiative?	Presence/absence of coordinating bodies	**Coordinating bodies were present**	• ESSIM Plan • RCCOM Terms of Reference (TOR) • ESSIM SAC Terms of Reference
Did the coordinating bodies involve all levels of governance?	Yes/no	**ESSIM's coordinating bodies involved all levels of governance**	• ESSIM Plan • ESSIM SAC TOR • RCCOM TOR
Were the coordinating bodies representative of both governmental and sectoral interests?	Representativeness of governmental and sectoral interests	**ESSIM's coordinating bodies were representative of both governmental and sectoral interests**	• ESSIM Plan • ESSIM SAC TOR
Did the coordinating bodies have defined mandates and authority?	Presence/absence of Terms of Reference (ToR)/ Memorandum of Understanding (MoU)	**ESSIM's coordinating bodies had agreed ToRs/MoUs in place**	• ESSIM Plan • RCCOM Terms of Reference • ESSIM SAC Terms of Reference
Was the ESSIM SAC membership composition appropriate for ESSIM's purpose?	Level of appropriateness	**The current membership composition was entirely appropriate**	• Questionnaire results

Significant progress was made towards implementing the ESSIM collaborative governance model since the inception of the ESSIM Initiative. As mentioned above, the RCCOM (including a program-level Coordinating Committee) and the ESSIM SAC were established. OCMD provided resource and secretariat support for the ESSIM SAC. Four ESSIM Forum workshops were held in 2001, 2002, 2005, and 2008. The Federal-Provincial ESSIM Working Group was active from 2001 to 2005, at which point it was discontinued in lieu of the RCCOM structure. Related structures, such as the Nova Scotia Provincial Oceans Network (PON), were supported by the ESSIM process.

New multi-sectoral coordinating mechanisms relevant to ESSIM were also created. For example, several ESSIM SAC sub-committees were formed to address specific issues (e.g., a fisheries/telecommunications working group and an ENGO caucus). A Memorandum of Understanding (MOU) on Coastal and Ocean Management was also negotiated and signed between the Government of Canada and the Government of Nova Scotia in 2011.

Governmental interests were represented in all three coordinating bodies and sectoral interests were represented within the ESSIM SAC. Municipal, provincial, federal, and First Nations levels of government were represented at the ESSIM SAC.

The membership composition of the ESSIM SAC in May 2012 was[12]:

- Government of Canada: 4 members
- Government of Nova Scotia: 3 members
- Government of Newfoundland and Labrador: 1 member
- Canada-Nova Scotia Offshore Petroleum Board: 1 member
- Municipal Government: 2 members
- Aboriginal Peoples: 3 members
- Commercial Fisheries: 5 members
- Oil and Gas: 2 members
- Conservation Groups: 3 members
- Tourism: 1 member
- Community Groups: 2 members
- Academic and Private Sector Research: 2 members
- Transportation: 1 member
- Telecommunications: 1 member

Questionnaire participants were asked if the ESSIM SAC's membership composition was appropriate for ESSIM's purpose. 52% of participants selected "The current membership is entirely appropriate" and 25% of participants selected "The current membership composition of the Advisory Committee is not entirely appropriate, but contains only one or two gaps". Despite the majority of participants selecting that the membership composition was appropriate, some participants indicated that there were some gaps. A few participants indicated that the academic

[12]It should be noted that when the SAC was initially established, the commercial fishing industry was allocated four seats and conservation groups were allocated two seats. These allocations were later increased to five and three respectively, at the request of the sectors. Although the additional seat for the commercial fisheries was initially proposed for a one year period, this increase became permanent.

and private research sector was under-represented. Several participants felt that the commercial fisheries sector was over-represented. Several participants also noted that certain sectors were essentially un-represented due to the non-attendance of their representatives.

The SAC Terms of Reference was discussed at the SAC evaluation workshop. Participants expressed that the document had worked well as an "open document" that was continually being updated, however, it was generally felt that certain parts of the document were not clear enough, particularly in terms of that SAC's mandate and the SAC members' roles with respect to the implementation of the ESSIM Plan.

Stakeholder Involvement

Table 6. Evaluation questions and indicators for theme "Stakeholder and Public Involvement"

Evaluation Question	**Indicator(s)**	**Assessment**	**Data Sources**
Were stakeholders satisfied with their participation in the ESSIM Initiative?	Level of satisfaction	**Mostly satisfied**	• Questionnaire results • Workshop results
Were there sufficient opportunities for stakeholders to be involved in the drafting of the ESSIM Plan?	Level of sufficiency	**Mostly sufficient**	• Questionnaire results
Were there sufficient opportunities for stakeholders to be involved in the ESSIM Initiative?	Level of sufficiency	**Mostly sufficient**	• Questionnaire results
	Total number of ESSIM SAC meetings held	**21**	• ESSIM SAC minutes
	Total number of ESSIM Forums held	**4**	• ESSIM Forum minutes
Were ESSIM SAC members satisfied with the number of ESSIM SAC meetings held per year?	Level of satisfaction	**Mostly satisfied**	• Questionnaire results
Were ESSIM SAC members satisfied with the content of ESSIM SAC meetings?	Level of satisfaction	**Mostly satisfied**	• Questionnaire results

Most ESSIM sectors participated in the ESSIM Initiative in some capacity. The primary mechanisms for this were via the ESSIM SAC and the ESSIM Forum. Questionnaire participants were asked how satisfied they were with their participation in the ESSIM Initiative. 32.7% of participants selected "mostly satisfied", 26.5% selected "somewhat satisfied", and 26.5% selected "completely satisfied".

A variety of generally positive written responses was provided by questionnaire participants. Several participants referenced the Initiative's early years when the focus was on the drafting of the ESSIM Plan. However, some participants noted that the process lost momentum in its final few years.

There was also a general discussion at the SAC evaluation workshop about stakeholders' level of satisfaction with their participation in the ESSIM process, as well as their early expectations of the Initiative. Consistent with the questionnaire results, most workshop participants expressed general satisfaction with their participation in the ESSIM Initiative. There was however, frustration with the failure to have the plan formally endorsed by the Minister of Fisheries and Oceans, which was a major expectation of stakeholders. Some participants of the workshop also expressed that they expected that the ESSIM Plan would be used more extensively in the evaluation and assessment of ongoing activities and new projects within the Eastern Scotian Shelf and that the ESSIM SAC would have an advisory role to the Department. For example, some participants noted that the ESSIM SAC could have played a more explicit role in the selection process of the Marine Protected Area Area of Interest (AOI). The SAC provided input throughout this process but did not design the process or provide a consensus recommendation on the AOI selection. Finally, participants expressed that the implications of the ESSIM Initiative being a pilot project was uncertain throughout their participation on the ESSIM SAC. Some participants perceived that the plan development phase of the Initiative was the pilot project and that plan implementation would continue indefinitely. The ESSIM Initiative's status as a pilot project is not mentioned in the SAC's terms of reference.

Questionnaire participants were asked if there had been sufficient opportunities for stakeholders to be involved in the ESSIM Initiative. 40.8% of participants selected "mostly sufficient", 26.5% selected "completely sufficient", 16.3% selected "I don't know", and 12.2% selected "somewhat sufficient". It is important to note that only individuals who had participated in the ESSIM process in some capacity were invited to complete the questionnaire.

The ESSIM SAC was the primary mechanism for stakeholders to participate in the ESSIM Initiative. There were a total of 21 ESSIM SAC meetings. The ESSIM SAC met quarterly in the early years of ESSIM but meetings dropped to 1-2 times per year in recent years. 38.9% of questionnaire participants indicated that they were mostly satisfied with the number of ESSIM SAC meetings held per year, 19.4% selected "completely satisfied", 19.4% selected "somewhat satisfied", and 13.9% selected "I don't know".

> *The OCMD secretariat developed interesting and relevant agendas regarding important issues and developments in the ESSIM planning area. However, a number of regulatory planning issues regarding new human uses were not brought to the table even for information.*
>
> -Questionnaire Participant

55.6% of questionnaire participants selected "mostly satisfied" and 30.6% of participants selected "somewhat satisfied" when asked about their satisfaction with the content of ESSIM SAC meetings. Some of the written comments reflected this satisfaction while other participants perceived that the agenda was "DFO-centric" and that several relevant marine planning issues were not discussed (e.g., one participant mentioned the licensing

of a new sea cucumber fishery). One questionnaire participant noted that since ESSIM was limited in scope to the offshore, the possibility of extensive community-based interest and engagement by way of the ESSIM SAC was limited.

Capacity and Interest

Table 7. Evaluation questions and indicators for theme "Capacity and Interest"

Evaluation Question	Indicator(s)	Assessment	Data Sources
Did all sectors have the capacity to actively participate in ESSIM?	Capacity (yes/no)	**No**	• Questionnaire results
	Average attendance rate of ESSIM SAC members at ESSIM SAC meetings	**75%**	• ESSIM SAC minutes
Did all sectors have the interest to actively participate in ESSIM?	Interest (yes/no)	**Not all sectors have the interest to actively participate**	• Questionnaire results
	Average attendance rate of ESSIM SAC members at ESSIM SAC meetings	**75%**	• ESSIM SAC minutes
What was the capacity of OCMD staff devoted to the ESSIM Initiative?	Average number of staff dedicated to the ESSIM Initiative between 1999 and 2011	**2.5**	• Internal ESSIM Costing Exercise
What level of financial resources was allocated to the ESSIM Initiative?	Average dollars per year coded to "ESSIM" within the Oceans and Coastal Management Division between 1999 and 2011 (salary and operating funds)	**$272,279**	• Internal ESSIM Costing Exercise

The attendance rate of ESSIM SAC participants may be an indicator of interest and/or capacity. From the ESSIM SAC's first meeting in 2005 to the 19th meeting in 2011 the attendance rate of ESSIM SAC members averaged approximately 75%. The attendance rate ranged from a low of approximately 65% to a high of 80%.

Questionnaire participants were asked if stakeholders had the capacity to actively participate in the ESSIM process. 34.7% of participants selected "Yes"; 36.7% of participants selected "No"; and 26.6% of participants selected "I don't know". Several questionnaire participants noted that certain sectors lacked the financial resources to participate fully in the ESSIM Initiative. Other participants noted a lack of time to participate, particularly for those members located outside the Halifax area.

> *It is more difficult for many non-government participants to attend all-day meetings, especially for those people located outside the Halifax area. In addition, ESSIM is one initiative, competing for attention time resources with many other concerns and initiatives.*
>
> -Questionnaire Participant

Questionnaire participants were also asked if all sectors have the interest to actively participate in the ESSIM Initiative. 14.3% of participants selected "Yes"; 44.9% of participants selected "No"; and 40.8% of participants selected "I don't know". The issue of interest was interpreted differently in the written questionnaire responses. For example, one participant gave a detailed explanation as to why all sectors should have an interest in participating and summarized their motivations for participating. Several participants interpreted that certain sectors (the offshore commercial fisheries sector, the Government of Newfoundland and Labrador, and the tourism industry) lacked an interest in the process due to their absence at ESSIM SAC meetings in recent years[13]. A few participants noted that the participation of several sectors waned in the Initiative's final years due to a perceived lack of progress. Finally, several participants noted that the commercial fisheries sectors seemed to be interested in participating only when there was something being discussed that might directly impact their sector.

The level of financial resources that were dedicated to the ESSIM Initiative has been significant. Between 1999 and 2011, there has been an average of 2.5 OCMD staff members dedicated directly to the ESSIM Initiative. From 1999 to 2011, the average cost of ESSIM per year within OCMD was $272,279. The highest cost was in the 2006-07 fiscal year when $554,400 was spent. These expenditures include salary and project operating funds. These figures do not account for the significant financial and in-kind contribution of other government departments and ESSIM sectors since the Initiative's inception.

Related to capacity are the resources and facilities available for use for the ESSIM Initiative. The ESSIM process had the advantage of having the resources and facilities of Canada's most active and prestigious oceanographic institution, the Bedford Institute of Oceanography (BIO), at its disposal. These include expertise, office facilities and secretarial support, ocean monitoring equipment and programmes (ships, instrumentation, and satellite), mapping and geographic information system (GIS) facilities, and research and laboratory facilities.

[13]The Government of Newfoundland and Labrador dis-continued its participation in SAC meetings due to a disagreement over the ESSIM area boundary.

Collaboration and Decision Making

Table 8. Evaluation questions and indicators for theme "Collaboration and Decision Making"

Evaluation Question	Indicator(s)	Assessment	Data Sources
What level of collaboration between different government departments was achieved as a result of the ESSIM Initiative?	Level of collaboration	**A moderate level of collaboration has been achieved**	• Questionnaire results
How satisfied were ESSIM SAC members with the consensus-based approach to decision making?	Level of satisfaction	**Mostly satisfied**	• Questionnaire results

Collaboration and effective decision making are essential components of integrated management. The ESSIM SAC and RCCOM provided an opportunity for diverse sectors to collaborate on issues of mutual concern. Questionnaire participants, however, were not in agreement as to the level of collaboration that was achieved as a result of the ESSIM Initiative. 50% of participants indicated that a moderate level of collaboration was achieved; 23.9% of participants indicated that a low level of collaboration was achieved; and 17.4% of participants indicated that a high level of collaboration was achieved.

A few participants indicated that the level of collaboration between federal and provincial departments had been strengthened as a result of the ESSIM Initiative since it served as a catalyst for the creation of RCCOM in 2005 (see Section 3.1). One participant indicated that the ESSIM SAC had initiated a high level of collaboration between some sectors, in particular, oil and gas, shipping, conservation and community organizations. Another participant suggested that the ESSIM Initiative had provided a low level of actual collaboration but that there had been opportunities for diverse groups to discuss issues around a common table. One participant perceived that the sector-based action plans that were developed were not collaborative because, in their opinion, some stakeholders were not allowed to participate in the action plans of others despite having an interest.

The theme of collaboration was also discussed at the SAC evaluation workshop. Participants generally agreed that the ESSIM process influenced the creation of, or strengthened, the following collaborative arrangements:

- Regional Committee on Coastal and Ocean Management
- Provincial Ocean Network
- Federal/Provincial ESSIM Working Group
- ENGO caucus
- Fishing Industry/Telecom Working Group

Some workshop participants felt that collaboration within the ESSIM SAC had worked well around shared interests and tangible tasks such as the drafting of the ESSIM Plan. The ESSIM SAC allowed for input and promoted respect, even in the absence of agreement. Some participants noted that it was helpful to have the opportunity to understand other sectors' point of view and that ESSIM's big picture "one ocean" approach inspired collaboration. Several high

points of collaboration were noted, including the decision to have a non-governmental co-chair; the drafting of a letter of support regarding the Government of Canada - Government of Nova Scotia MOU; the drafting of the Spatial Conservation Action Plan; and the creation of the Fisheries-Telecommunications sub-committee.

Consensus-based decision making was the primary form of decision making used for the ESSIM SAC. Questionnaire participants were asked about their satisfaction with this form of decision making. 38.9% of participants selected "mostly satisfied"; 36.1% selected "somewhat satisfied"; and 8.3% of participants selected "not at all satisfied".

The questionnaire results included several lengthy written comments regarding consensus-based decision making, most of which reflected a view that it was the most appropriate decision-making approach for the ESSIM SAC but that it had been difficult to use in certain circumstances. In particular, participants noted that:

- Using consensus-based decision making for the Plan's development had been fairly effective.
- There was a very long delay (approximately one year) surrounding one issue (the appointment of a non-governmental co-chair) because of non-consensus.
- SAC members could have been better educated on how to use consensus-based decision making.
- There should have been a formalized alternative decision-making structure in place when consensus could not be achieved.

The above points were echoed in the evaluation workshop. Participants were generally satisfied with the consensus-based approach to decision making but a clearer mandate and more detailed terms of reference for the ESSIM SAC would have served to resolve some of the problems in decision-making that arose. Furthermore, some participants felt that using consensus-based decision making in the plan development stage was appropriate but an alternative decision making model may have been more effective during implementation of the Plan.

These findings on consensus-based decision making are somewhat echoed in a recent paper based on interviews with ESSIM SAC members (Flannery and Ó Cinnéide 2012). Some participants in this study noted that consensus-based decision making was an obstacle to progress in some circumstances and that due to the inability to reach consensus, the ESSIM SAC had to abandon attempts at action planning and focus solely on developing strategic objectives (Flannery and Ó Cinnéide 2012).

Leadership and Commitment

Table 9. Evaluation questions and indicators for theme "Leadership and Commitment"

Evaluation Question	Indicator(s)	Assessment	Data Sources
How effective were components of the ESSIM Initiative's collaborative planning model in providing leadership for the ESSIM Initiative?	Level of effectiveness	**Mostly effective**	• Questionnaire results
How committed were sectors in the Eastern Scotian Shelf to the ESSIM Initiative?	Level of commitment	**Mostly committed**	• Questionnaire results

Questionnaire participants were asked to rate how effective the components of ESSIM's collaborative planning model were in providing leadership for the ESSIM Initiative. The components asked about were: Fisheries and Oceans Canada (Oceans and Coastal Management Division, Maritimes Region); Fisheries and Oceans Canada (National Capital Region); the RCCOM; the ESSIM SAC; and the ESSIM Forum[14]. "Mostly effectively" was chosen by a majority of the participants for all of the components except for Fisheries and Oceans Canada - National Capital Region (NCR) where 39.1% of participants chose "somewhat effective" and 39.1% of participants chose "not at all effective". Most of the written comments for this question related to DFO – NCR's level of leadership for the ESSIM Initiative. Several participants perceived the lack of Ministerial sign off of the plan as symbolic of a lack of leadership for the Initiative at the national level.

The theme of leadership was also discussed at the evaluation workshop. Several leadership bright spots were identified, including the approval of the ESSIM Plan and the decision by the ESSIM SAC and OCMD to publish the Plan and move forward without official endorsement from the Minister of Fisheries and Oceans.

Questionnaire participants were also asked about the commitment of the sectors in the Eastern Scotian Shelf to the ESSIM Initiative. It was noted in the question that commitment in this case meant engagement, involvement, and the mobilization of resources. There was a varied response to this question for each sector. The two most frequently selected responses for each sector are noted in Table 10.

[14] A Federal-Provincial ESSIM Working Group operated until 2005. The group was established in January 2001 as an intergovernmental forum to focus on policy, management, operations, and regulatory coordination for the ESSIM Initiative.

Table 10. Sector Commitment to ESSIM

Sector	Most frequently selected response	Percentage/ Number	Second most frequently selected response	Percentage/ Number
Government of Canada	Mostly Committed	37%, n=17	Somewhat Committed	28.3%, n=13
Government of Nova Scotia	Somewhat Committed	29%, n=19	Mostly Committed	32.6%, n=15
Government of Newfoundland and Labrador	I don't know	43.5%, n=20	Not at All Committed	37%, n=17
Offshore Petroleum Board	Mostly Committed	42.3%, n=19	I don't know	26.1%, n=12
Municipal Government	I don't know	39.1%, n=18	Somewhat Committed	23.9%, n=12
Aboriginal Peoples	I don't know	32.6%, n=15	Mostly Committed	28.3%, n=11
Commercial Fisheries Industry	Mostly Committed	37%, n=17	Somewhat Committed	32.6%, n=15
Petroleum Industry	Mostly Committed	39.1%, n=18	I don't know	30.4%, n=14
Environmental Non-Governmental Organization	Completely Committed	43.5%, n=20	Mostly Committed	39.1%, n=18
Community Groups	Mostly Committed	37%, n=17	Completely Committed	26.1%, n=12
Academic and Private Sector Research	Mostly Committed	32.6%, n=15	I don't know/Somewhat Committed (tie)	23.9%, n=11
Transportation Industry	Mostly Committed	39.1%, n=18	I don't know	32.6%, n=15
Telecommunications Industry	I don't know	41.3%, n=19	Mostly Committed	37%, n=17
Tourism Industry	I don't know	50%, n=23	Mostly Committed	17.4%, n=8

The most frequently selected response across sectors was "mostly committed". Four sectors (Government of Newfoundland and Labrador, Municipal Government, Telecommunications Industry, and Tourism Industry) had a high rate of "I don't know" selections. This is most likely a reflection of the low attendance of these groups (particularly Government of Newfoundland and Labrador and the Tourism Industry) at the ESSIM SAC meetings.

One participant noted that commitment and engagement of all sectors was higher during the earlier years of the Initiative, particularly during the drafting of the ESSIM Plan. One participant noted that there was a high level of commitment by most sectors but active participation in the

Initiative was limited in some cases due to a lack of progress, lack of resources, and the offshore focus of the Initiative.

The theme of commitment was also discussed at the evaluation workshop. Several participants noted that the members of the SAC had all generally been committed to the ESSIM Initiative, and that any such stakeholder participation model "self-selects" committed individuals, particularly those members who are volunteers. It was noted by some participants that those members who were less committed to the process stopped participating, leaving the remaining members with a strong desire to work together. Some participants felt that the ESSIM Initiative has been constrained due to a lack of "buy in" to the process from the offshore fisheries sector. Finally, as with some questionnaire participants, the lack of endorsement of the ESSIM Plan by the Minister of Fisheries and Oceans was perceived by some workshop participants as a lack of commitment to the process by DFO at the national level. This sentiment was echoed in a paper written by the Maritimes Aboriginal Aquatic Resources Secretariat (MAARS) (Dutka et al. 2010).

3.2.2 Appropriate legislation, policies, plans and programs are in place; legal obligations and commitments are fulfilled

Implementation of integrated oceans management requires the use of various regulatory-based tools, such as legislation and supporting regulations, plans, licences, protected areas, and environmental assessment processes. Legislation, policies, plans, and programs must not only be assessed in the context of integrated management, but also to ensure that Canada's international obligations are being fulfilled.

A total of 13 evaluation questions were used to assess the extent to which objective "Appropriate legislation, policies, plans, and programs are in place" was achieved. Due to the high number of evaluation questions, they have been grouped into four themes: legislation, environmental impact assessment, integrated management plan, and work planning and reporting.

Legislation

Table 11. Evaluation questions and indicators for theme "Legislation"

Evaluation Question	Indicator(s)	Assessment	Data Sources
Does the legislation enabling the implementation of ICOM support ICOM goals and objectives?	Presence/absence of enabling legislation	**The *Oceans Act* (1996) supports ICOM goals and objectives**	• *Oceans Act* (1996)
Does the legislation enabling the implementation of ICOM set out processes for institutional cooperation and coordination?	Presence/absence of enabling legislation	**The *Oceans Act* (1996) sets out processes for institutional cooperation and coordination**	• *Oceans Act* (1996)
Was a review of existing legislation and its adequacy, effectiveness, and/or efficiency completed?	Presence/absence of published review	**A document exists that reviews existing legislation and its adequacy, effectiveness, and/or efficiency**	• Chao et al., 2004
Were international obligations and commitments relevant to ESSIM identified?	Presence/absence of published obligations and commitments	**A document exists where international obligations and commitments have been identified**	• Chao et al., 2004
Were jurisdictional relationships relevant to ESSIM clarified?	Presence/absence of clarified jurisdictional relationships	**A document exists where jurisdictional relationships relevant to ESSIM have been clarified**	• Chao et al., 2004 • ESSIM Plan

There is a multitude of Canadian federal and provincial legislation that provides support for the implementation of ICOM goals through processes like the ESSIM Initiative. The main ICOM-related legislation is the 1996 *Oceans Act* which defines the administrative players and mandates DFO to be the lead agency on coastal and marine management. It also allows for the development of integrated management and planning areas (e.g., LOMAs) and MPAs. Processes for institutional cooperation and coordination are set out in Sections 31 (Integrated management plans) and Section 32 (Implementation of integrated management plans) of the *Oceans Act*.

No ESSIM-specific mechanism was developed for evaluating proposed legislation, policies, plans, and programs. However, a review of existing legislation was compiled by OCMD in the document "Overview of Federal, Provincial, and International Ocean Regulatory and Policy Frameworks on the Scotian Shelf" (Chao et al. 2004). The document describes the key national and international legal instruments applicable to ocean use sectors in the management area. It provides a listing of international bodies, agreements, and instruments, and describes their scope,

purposes, and their implementation and application in Canadian law, with specific reference to the eastern Scotian Shelf.

Some sectors have assessed the effectiveness and efficiency of relevant legislation, policies, and plans. For example, the Maritime Aboriginal Peoples Council (MAPC) has directly reviewed, communicated and provided suggested language and improvement to various federal government proposals and legislation. The ENGO caucus has also been active in this area. In 2007, the ENGO caucus, in conjunction with DFO and other SAC members, completed a conservation gap analysis of the ESSIM area as part of the development of the Spatial Conservation Action Plan. DFO has also supported a relevant Dalhousie University Marine Affairs Program policy and legislation research project (McCrimmon and Fanning 2010, 2011).

Environmental Impact Assessment

Table 12. Evaluation question and indicator for theme "Environmental Impact Assessment"

Evaluation Question	**Indicator(s)**	**Assessment**	**Data Sources**
Did statutory procedures exist for environmental impact assessments (EIA) for projects in the ESSIM area?	Presence/absence of EIA Statutory procedures	**Statutory procedures exist/existed for environmental impact assessments (EIA) for projects in the ESSIM area**	• *Canadian Environmental Assessment Act*

The 1992 *Canadian Environmental Assessment Act*, administered by the Canadian Environmental Assessment Agency (CEAA), ensures that the environmental effects of development projects are reviewed. Marine and coastal areas are included within this legislation. EIA procedures have, and are, being applied when applicable throughout the ESSIM area – particularly concerning oil and gas projects. EIA activities are carried out on a sectoral basis, and administered by individual relevant governmental agencies. Reviews of commercial fishery activities in the ESSIM area are carried out internally by DFO under the conditions of the *Fisheries Act* (1985). This departmental process involves scientific peer review and the development of Integrated Fisheries Management Plans to address management and conservation measures.

Integrated Management Plan

Table 13. Evaluation questions and indicators for theme "Integrated Management Plan"

Evaluation Question	Indicator(s)	Assessed Indicator	Data Sources
Was there an integrated management plan in place?	Presence/absence of plan	**There was an integrated management plan in place**	• ESSIM Plan
Was there a mechanism in place to revise the management plan?	Presence/absence of plan revision mechanism	**There was not a documented mechanism in place to revise the ESSIM Plan**	• ESSIM Plan
Were stakeholders satisfied with the content and structure of the ESSIM Plan?	Level of satisfaction	**Mostly satisfied**	• Questionnaire results
Was the ESSIM Plan endorsed by relevant government departments?	Status of plan endorsement by Minister of Fisheries and Oceans	**The ESSIM plan was not endorsed by the Minister of Fisheries and Oceans**	

As mentioned above, the ESSIM Plan was finalized in 2007. The Plan contains a comprehensive set of goals, objectives, and strategies for collaborative governance and integrated management, sustainable human use, and healthy ecosystems. The content and structure of the ESSIM Plan evolved during the drafting process. Earlier drafts of the Plan included high-level objectives, sub-objectives, management strategies, and management actions. After several years of discussions with sectors (primarily through the ESSIM SAC and RCCOM), it was determined that consensus would not be achievable at this level and it was decided to produce a strategic-level planning document and omit the sub-objectives and management actions previously drafted. The management strategies contained in the Plan were not committed to by the individual sectors but serve to illustrate ways to achieve or work towards each objective. It was intended that specific actions, time frames, and resource requirements would be achieved through an action planning process.

> *I am pleased with the content and structure of the Plan as released but was disappointed that it was limited to objectives and management strategies. This is particularly disappointing given its high level of "indicative or directional" planning and the lack of any compliance instruments involved.*
>
> -Questionnaire Participant

The Plan does contain some direction regarding plan revision. For example, it states that a comprehensive review would be undertaken every five years by OCMD "with the support of all components of the collaborative planning model". However, there were no specifics on how the review process would proceed.

Questionnaire participants were asked directly how satisfied they were with the content and structure of the ESSIM Plan. 49% of participants selected "mostly satisfied" and 26.5% of participants selected "somewhat satisfied". Several participants noted in their comments that they were satisfied with the Plan. However, a few participants were disappointed that the Plan was limited to objectives and high level strategies.

The ESSIM Plan was finalized in 2007 but, as mentioned previously, did not receive official endorsement from the Minister of Fisheries and Oceans as an integrated management plan under the *Oceans Act*. It is important to recognize that although Ministerial endorsement was not received, the ESSIM Plan did have the formal support of the RCCOM and the national level Interdepartmental Committee on Oceans. In addition, DFO did authorize the publishing and public dissemination of the ESSIM Plan.

Work Planning and Reporting

Table 14. Evaluation questions and indicators for theme "Work Planning and Reporting"

Evaluation Question	Indicator(s)	Assessment	Data Sources
Were work plan activities completed, on track for completion, or otherwise addressed?	Percentage of 2010-2012 ESSIM SAC work plan activities that were completed, on track for completion, or otherwise addressed as of October 11, 2011 update	**86%**	ESSIM SAC work plan 2010-2012
Were annual reports written to document accomplishments and identify priority activities for short and long-term planning?	Presence/absence of annual reports	**Annual reports were written**	ESSIM SAC sector reports ESSIM SAC work plan 2010-2012
Were ESSIM objectives and principles incorporated into stakeholder resource management plans?	Presence/absence of ESSIM objectives in integrated fisheries management plans	**ESSIM objectives and principles were incorporated into integrated fisheries management plans**	Interviews with OCMD staff

The ESSIM SAC produced two work plans: one in 2009-2010 and another for the period of May 2010 to March 2012. The most recent work plan described the priority interests and activities of the SAC for the period of May 2010 to March 2012. In the update completed in October, 2011,

of the 22 work plan items[15], 19 of the items (approx. 86%) were identified as completed, on track for completion, or otherwise addressed.

The work plan activities that were not completed, on track for completion, or otherwise addressed were:

- Assess SAC membership for appropriate representation
- Promote and share information on integrated management
- Raise awareness and share information at the community level

In addition to the publication of the ESSIM Plan in 2007 and the preparation of the individual sector reports, several relevant plans were initiated, including the Spatial Conservation Action Plan and the Fisheries Sector Framework Action Plan. Integrated Fisheries Management Plans (IFMPs) are the primary vehicle through which the ESSIM objectives are addressed by the fisheries sector. The DFO Maritimes Region ecosystem approach to management (EAM) framework is applied in the development of all revised IFMPs. There are direct links between the ESSIM Plan's Healthy Ecosystems objectives and the biodiversity, habitat, and productivity objectives and strategies of the EAM framework.

There are several other plans and strategies which reference some of the goals and objectives of ESSIM either directly or indirectly, including oil and gas environmental assessments and the Province of Nova Scotia's Coastal Strategy.

3.2.3 Ocean users and regulators are compliant and accountable

Within the context of integrated management, compliance can be viewed as a continuum of tools, techniques, and approaches extending from raising awareness and stewardship through to activities involving regulatory based control and enforcement. Accountability is an essential pre-requisite to successful implementation of integrated management and, according to the Plan, participants in the planning process are expected to promote and build accountability to the Plan within their communities of interest and constituencies.

Two evaluation questions were used to assess the extent to which objective "Oceans users and regulators are compliant and accountable" was achieved (Table 15). It would be difficult to assess the extent of compliance to all of the relevant legislation, regulations, and plans relevant to the ESSIM area. Therefore, the evaluation question relevant to compliance is focused on the development of a framework for compliance promotion.

[15]Tasks include revising the SAC TOR (completed), establishing a public website for the SAC (this was delayed due to issues with national web policy renewal), writing a letter to the Minister of Fisheries and Oceans regarding Plan endorsement (sent), completing individual sectors report (12 of 14 sector reports were completed), and promoting the development of the Government of Canada/Government of Nova Scotia MOU (signed March 2011).

Table 15. Evaluation questions and indicators for objective "Ocean users and regulators are compliant and accountable"

Evaluation Question	Indicator(s)	Assessment	Data Sources
Was a framework for compliance promotion developed and/or implemented?	Presence/absence of documented framework	**A documented framework does not exist**	• Interviews with OCMD staff
Was a framework for performance monitoring or reporting developed?	Presence/absence of framework	**A framework exists**	• ESSIM Plan • Walmsley 2006a

The ESSIM Initiative operated within a multi-jurisdictional context and functioned at a level above existing sector-based management for marine activities. Regulatory authorities remained responsible and accountable for implementing management policies and measures within their established mandates and jurisdictions. A variety of tools were suggested within the ESSIM Plan as means to achieve compliance promotion, including information sharing and communication, stewardship promotion, the development of best practices, and incentives programs. Several departmental compliance programs are in place, such as DFO Habitat Program compliance monitoring, DFO fisheries surveillance and enforcement, and Environment Canada inspections and investigations. Several industry standards are also in place, including the Marine Stewardship Council (MSC) Certification Program and the SeaChoice eco-labelling program. However, there is no documented framework for compliance promotion for the ESSIM Initiative.

The ESSIM Plan itself contains little guidance on performance monitoring or reporting for ocean users and regulators. A system for performance monitoring and reporting was developed, although its uptake by various ocean users and regulators was somewhat inconsistent. As mentioned previously, sector reports, prepared in 2009-2010, reported on actions and initiatives taken towards ESSIM objectives. Most sectors completed these reports but the level of detail contained within the reports varied. Some participants at the SAC evaluation workshop noted that the format of the sector reports, which was sub-divided according to the ESSIM objectives, was challenging to follow since it was difficult to attribute actions or initiatives towards the individual ESSIM objectives. The ESSIM SAC also produced two work plans (in 2009/10 and 2010/11) and a progress report was prepared that described progress against work plan items.

3.2.4 Ocean stewardship and best practices are implemented

Non-regulatory management tools and approaches such as guidelines, protocols for best practices, and industry-based statements are examples of key mechanisms for implementing integrated management. Two evaluation questions were used to assess the extent to which the objective "Ocean stewardship and best practices are implemented" was achieved (Table 16).

Table 16. Evaluation questions and indicators for objective "Ocean stewardship and best practices are implemented"

Evaluation Question	Indicator(s)	Assessment
Were there relevant guidelines and best practices in place?	Presence/absence of guidelines and best practices	**There are relevant guidelines and best practices in place that apply to the ESSIM area**
Were existing guidelines and best practices reviewed and improved/adapted as necessary?	Presence/absence of reviewed guidelines and best practices	**A document does not exist where existing guidelines and best practices have been formally reviewed within the context of ESSIM**

There are a number of relevant guidelines and best practices in place that apply to the ESSIM area. These include codes of conduct that have been developed by the oil and gas industry, a statement of practice for seismic activity, and the MSC certification process. By way of example, the code of practice for personnel of Exxon Mobil's Sable Offshore Energy Project relating to stewardship of Sable Island and the Gully MPA is cited in the ESSIM Plan as an example of a relevant code of conduct. In fact, the ESSIM Plan itself could be considered to some extent to be a code of best practice for activities within the ESSIM area because it includes a set of management strategies for each objective that was agreed upon by stakeholders.

There are numerous examples of relevant education training initiatives including industry/sector certification (e.g., Mime'j Seafoods Ltd's Vessel Captains and all harvesters have received Certified Training in Leatherback Turtle Release), workshops (e.g., on new ballast water regulations), departmental public outreach events (e.g., Oceans Day), and various initiatives sponsored by communities or ENGOs (e.g., EcoAction).

Individual sectors have reviewed various guidelines and best practices in recent years. For example, a review was done as part of State of the Nova Scotia Coast Report drafting process (CBCL 2009). Similarly, guidelines related to the oil and gas industry and marine transportation are continually updated. However, existing guidelines and best practices were not formally reviewed, improved or adapted as a direct outcome of implementation of the ESSIM Plan.

3.2.5 Multi-sectoral resource use conflict is reduced

A reduction in the number of multi-sectoral resource use conflicts is a tangible (albeit difficult to measure) objective of the ESSIM Initiative. It was the intent of the ESSIM Initiative to reduce the number of conflicts that were occurring by developing mechanisms that allow ocean users to come together to discuss and address issues before a conflict arises.

Four evaluation questions were used to assess the extent to which the objective of "Multi-sectoral resource use conflict is reduced" was achieved (Table 17).

Table 17. Evaluation questions and indicators for objective "Multi-sectoral resource use conflict is reduced"

Evaluation Question	Indicator(s)	Assessment	Data Sources
What stakeholders are involved or have been involved in conflicts? What issues are at stake? What is the nature and intensity of the conflicts?	Workshop results	**See below**	• Workshop
Were there agreed-on procedures and mechanisms for the resolution of conflicts within the ESSIM Initiative?	Presence/absence of document that outlines framework for the resolution of conflicts	**A document exists that outlines a framework for the resolution of conflicts within the ESSIM Initiative**	• ESSIM SAC TOR • BLSmith Groupwork Inc. 2005
Were resource use conflicts within the ESSIM area officially reported to the ESSIM SAC?	Presence/absence of resource use conflicts in ESSIM SAC minutes from 2011 and 2012	**Resource use conflicts are present in ESSIM SAC minutes from 2011 and 2012**	• ESSIM SAC minutes
	Presence/absence of documented procedure for reporting resource use conflict	**A document does not exist with a procedure for reporting resource use conflicts to the ESSIM SAC**	• Interviews with OCMD staff
How effective was the ESSIM Initiative in resolving conflicts between users or stakeholder groups?	Level of effectiveness	**Mostly effective**	• Questionnaire results

Conflicts related to the Eastern Scotian Shelf involve all levels of government and a broad range of stakeholders outside of government including industry, community groups, environmental organizations, academics, and interested individuals. The issues at stake, as identified by SAC evaluation workshop participants, include those related to economic development, environmental degradation, resource extraction, fishing, transportation, telecommunications, recreation, aboriginal rights, foreign relations, and international trade. The nature and intensity of conflicts on the Eastern Scotian Shelf range from significant to minor. Significant conflicts may include

the potential for one industry or stakeholder group to be excluded from access to a resource to which they have traditionally had access. Minor conflicts include the need to share access to a specific area where more than one activity occurs. Examples of conflict over human use in the ESSIM planning area include interaction between the oil and gas, telecommunications, and commercial fishing industries, the location of proposed conservation measures, and the expansion of existing and new activities, such as exploratory fisheries and oil and gas exploratory licenses.

Significant progress has been made in the area of understanding existing use patterns and interactions on the Eastern Scotian Shelf, most notably through OCMD's marine spatial planning program. The program has developed several products in recent years, including an atlas of human activity on the Scotian Shelf (Breeze and Horsman 2005) and a spatial decision support tool in ArcGIS. Impact assessments required in federal EAs for offshore oil and gas developments have also included a detailed assessment of existing use patterns and interactions.

Procedures and tools for addressing conflicts existed within ESSIM's governance structure (e.g., consensus-based decision making for ESSIM SAC meetings) and focussed mechanisms for conflict resolution were established through the ESSIM SAC (e.g., the fishing industry-telecommunications working group). Informal conflict resolution outside of the ESSIM governance structure occurred continuously. For example, in its sector report, MAARS reported working with Regional Harbour Authorities in an attempt to reduce conflicts in harbours.

A consultant was hired in 2005 to produce a document entitled 'Conflict, Collaboration and Consensus in the Eastern Scotian Shelf Integrated Management (ESSIM) Initiative' (Fisheries and Oceans Canada 2005b). This discussion paper was prepared in response to questions regarding how conflict would be resolved and/or avoided through the ESSIM planning process. Although the paper was not officially endorsed by the components of the ESSIM collaborative planning model (i.e., ESSIM SAC, RCCOM), it provides a good theoretical basis for conflict avoidance and resolution. One of the main tenants of the paper is that consensus-based decision making is a conflict avoidance/resolution method in itself.

The ESSIM SAC Terms of Reference, agreed to by all SAC members, included a protocol for situations in which there is a lack of consensus. This protocol was used several times during the history of the Initiative. For example, the creation of the fishing industry-telecommunications industry working group mentioned above followed this protocol. The creation of a smaller and more focussed working group diffused the "soap box talk" that may have occurred at the larger SAC table.

There was no specific procedure in place for reporting on the water resource use conflicts to the ESSIM SAC. One OCMD staff member noted in an interview that the SAC was not the "go to place" for bringing up and resolving conflicts. There were four ESSIM SAC meetings in 2011 and 2012. Resource use conflicts were mentioned in the sector roundtable portions of the minutes of two of the meetings. However, the main topics of the SAC members' roundtable updates were sector activities, special events, planned projects, and research projects.

32.6% of questionnaire participants selected "I don't know" and 30.4% of participants selected "mostly effective" to the question "How effective has the ESSIM Initiative been in resolving conflicts between users or stakeholder groups?" A few questionnaire participants noted that the ESSIM Initiative was effective in solving conflict between the telecommunications and fishing industries. Finally, one participant noted that there have not been that many "on the water" conflicts between sectors in the ESSIM area recently due to a decline in oil and gas activity.

Several workshop participants felt strongly that the formal and informal communication that occurred with the functioning of the ESSIM SAC prevented conflicts from occurring because it had allowed representatives from the various ESSIM sectors to get to know one another. A few participants expressed that knowing someone by name and knowing who to call about a particular issue and being able to put a face to a name was invaluable. This relationship building has allowed cross-sectoral conversations to occur which otherwise would have been more adversarial in nature. Several participants expressed that these personal connections would be lost with the end of the functioning of the ESSIM SAC.

3.2.6 Natural and social science research is responsive to knowledge needs

In order to achieve many of the objectives for multiple human use and healthy ecosystems, more information and knowledge of human and marine systems is required. In order for a natural and social science research program to be responsive to knowledge needs and influence management decisions, it is necessary to identify research priorities and needs and establish research structures and partnerships.

Seven evaluation questions were used to assess the extent to which the objective "Natural and social science research is responsive to knowledge needs" was achieved (Table 18).

Table 18. Evaluation questions and indicators for objective "Natural and social science research is responsive to knowledge needs"

Evaluation Question	Indicator(s)	Assessment	Data Sources
Was there an ESSIM research strategy?	Presence/absence of ESSIM-specific research strategy	**An ESSIM-specific research strategy exists**	• Interviews with OCMD staff
Was the research strategy implemented?	Status of implementation of research strategy	**The research strategy was not implemented**	• Interviews with OCMD staff
Was there an ESSIM research co-ordinating group or science advisory committee?	Presence/absence of co-ordinating group or science advisory committee	**There was an ESSIM Science working group from 2004-2006; this later became an Oceans Action Plan Science implementation group.**	• Interviews with OCMD staff
What scientific outputs were produced related to the ESSIM area?	Number of hits using keyword "Scotian Shelf" from January 1998 – March 2012 using ASFA search	**1,369**	• ASFA search
Were scientific outputs evaluated through objective peer and stakeholder review processes?	Presence/absence of formal scientific review process for DFO research	**A formal scientific review process exists for DFO research**	
Did the scientific outputs influence management activities in the ESSIM area?	Yes/no	**Scientific outputs influenced DFO management activities in the ESSIM area**	• Interviews with OCMD staff members
Was local ecological knowledge (LEK) used to support decision making?	Presence/absence of document that identifies local ecological knowledge in the ESSIM area	**A document exists that identifies local ecological knowledge in the ESSIM area**	

The proximity of the Bedford Institute for Oceanography, as well as several university institutions, has allowed for the Scotian Shelf to become one of the best studied marine areas in the world and there is a considerable amount of literature that is relevant to the ESSIM area. The Aquatic Sciences and Fisheries Abstracts (ASFA) reveal that since January 1998, there were more than 1,369 published scientific reports on the Scotian Shelf, with about 949 of these being peer-reviewed science articles. DFO reviews its scientific research findings through the Canadian Science Advisory Secretariat (CSAS) peer-review process, while its science needs are assessed and prioritized annually. Sectors also participate in several pre-established processes for reviewing research findings, such as the Program of Energy Research and Development (PERD) and the Fishermen and Scientists Research Society (FSRS).

Science input into the ESSIM Initiative largely followed a fragmented and opportunistic process. Although a valuable pool of DFO scientific resources and activities were in place, the ESSIM process was one of a number of competing priorities among other DFO programs (Walmsley and Arbour 2005). Walmsley and Arbour (2005) identified numerous institutional governance barriers associated with the involvement of science in decision-making in the ESSIM Initiative including: the organisation of science within Canada and DFO, the involvement of other agencies, the sources of research funds, differing priorities between agencies, and the absence of effective research coordination (including budget) within the ESSIM process.

An ESSIM Science working group was formed in 2004 to address research and support ecosystem assessment needs for the ESSIM area. It prepared a report on ecosystem dynamics of the eastern Scotian Shelf as a component of the ecosystem overview and assessment report prepared for the region (Zwanenburg et al. 2006). This group was transformed into a science working group for integrated management in general, and later focused on the implementation of the science aspects of the Oceans Action Plan.

In 2006, a report entitled 'A Proposed Strategy for Ensuring that Research is Responsive to the Knowledge Needs of the Eastern Scotian Shelf Integrated Management (ESSIM) Initiative' was published (Walmsley 2006b). The document, prepared by an external consultant, proposed an overall strategic approach to the ESSIM Plan objective of ensuring that natural and social science research is responsive to the knowledge needs of ESSIM stakeholders. According to an OCMD staff person, the intent was to reach agreement with ESSIM stakeholders on which elements of the proposed strategy would be pursued and to develop an action plan for their implementation. The creation of an inter-disciplinary research working group for ESSIM, operating through the ESSIM SAC, was suggested as a mechanism to guide and evaluate research within the ESSIM area. However, the existing Science working group was primarily focused on DFO activities and there were few points of communication with the SAC. Thus, the group did not address science needs identified by the SAC. This was primarily due to the SAC's overall focus on implementation and action planning as opposed to reporting.

In the absence of specific ESSIM projects requesting outputs for decision-making purposes, it is not possible to quantify the extent of use of scientific research outputs by managers. There are, however, indications that managers were/are continually making use of available information for a variety of uses. For example, according to an OCMD staff member, the ecological overview of the Scotian Shelf (Breeze et al. 2002) has been used as a reference and guide for most management activities and development proposals on the Scotian Shelf since it was published.

Federal departments have a duty to consult and use Aboriginal knowledge in decision making (e.g., inclusion in federal environmental assessments). In DFO Maritimes Region, specific research projects that use Aboriginal knowledge have been implemented through the Bras d'Or Lakes Collaborative Planning Initiative (CEPI).

In 2009, a document entitled 'Using Fish Harvesters' Local Ecological Knowledge (LEK) in Support of Identifying Ecologically and Biologically Significant Areas (EBSAs) on the Offshore Eastern Scotian Shelf' was published by OCMD (MacLean et al. 2009b). This document describes the results of a fish harvesters' survey that was intended to collect LEK in support of the identification of EBSAs[16].

3.2.7 Information management and communication are effective

Communication and information management are essential components of integrated management. In order for information management and communication to be effective, there should be mechanisms in place for multi-sectoral and intergovernmental information sharing, the provision of accessible information to stakeholders, and attempts made at increasing public awareness through education and communication.

Five evaluation questions were used to assess the extent to which the objective "Information management and communication are effective" was achieved (Table 19).

Table 19. Evaluation questions and indicators for objective "Information management and communication are effective"

Evaluation Question	Indicator(s)	Assessment	Data Sources
Were research and monitoring results regularly presented and discussed at an ESSIM-specific research symposium or other research forums to facilitate communication and collaboration?	Total number of ESSIM Forum workshops held from 1998-2012	4	• ESSIM Forum minutes
Was information on the ESSIM Initiative easily accessible to stakeholders?	Position of ESSIM web site in Google search result of "ESSIM" (at time of assessment)	#1	• ESSIM web site
	Number of publications available for download or linked to on the ESSIM web site	40	• ESSIM web site

[16] EBSAs are "those areas for which the ecological consequences of severe perturbation are greater than an equal perturbation in most other areas or for most other species" (Fisheries and Oceans Canada. 2004b).

Evaluation Question	Indicator(s)	Assessment	Data Sources
	Date of last update to ESSIM SAC web site	**2011-11-17**	• ESSIM web site
Was information being used by ESSIM stakeholders?	Number of unique page views of the "Introduction to the ESSIM Initiative" web page from January 2009 to January 2012	**1,847**	• Database and Data Administration Branch, DFO
	Number of registered users of the ESSIM SAC "Thinkwell" site (as of February 14, 2012)	**65**	• Thinkwell site
	Percentage of registered users of the ESSIM SAC "Thinkwell" site who have accessed the site (as of February 14, 2012)	**63%**	• Thinkwell site
How effective was the ESSIM SAC in communicating information to stakeholders and the public about the ESSIM Initiative?	Level of effectiveness	**Somewhat effective**	• Questionnaire • Workshop results
What level of understanding does the general public have about ESSIM?	Level of understanding	**A minimal level of understanding**	• Questionnaire • Workshop results

There were several mechanisms for formal information sharing relevant to the ESSIM Initiative in place including the ESSIM Forum, RCCOM meetings, ESSIM SAC meetings, DFO's ESSIM web site, and the ESSIM SAC "Thinkwell" web site.

Four ESSIM Forum workshops were held between 2002 and 2008. The workshops provided an inclusive assembly for all stakeholders to participate in the ESSIM Initiative. Research and monitoring results were presented and discussed at these events. The ESSIM Forum workshops were open to all stakeholders and interested individuals and participants included government, coastal communities, Aboriginal groups, fisheries, oil and gas, marine conservation, telecommunications, shipping, and academia.

DFO's ESSIM web site (found at http://www.mar.dfo-mpo.gc.ca/e0010285) is the first web site that appears in a Google search for the keyword "ESSIM" making the site easy for stakeholders

to find. There are approximately 40 publications available for download or linked to on the site. As of February 13, 2012, the site was last updated on November 17, 2011. It was not possible to determine if ESSIM stakeholders are using the site but some general statistics on overall site usage indicated that the page is being viewed (Table 19).

Another source of information for ESSIM stakeholders was the ESSIM SAC "Thinkwell" web site. This web site was set up and activated in 2008 with support from the ESSIM SAC. It was intended to be used as an online forum for discussion amongst SAC members. Each SAC member was registered when the site was created but it was never used by members for discussion between SAC meetings. Sixty-three percent of registered members accessed the site. The site was used as a repository for ESSIM SAC documents, such as meeting minutes and presentations.

Some examples were given in the sector reports of information sharing, education, and communication initiatives relevant to the ESSIM Initiative. The sectors reported hosting various conferences, the publication of information bulletins (e.g., Transport Canada Ship Safety Bulletins), and supporting information/research networks (e.g., Atlantic Coastal Zone Information Steering Committee). Some examples of education and communication initiatives, including participating in special events (e.g., Oceans Day), were also given, distributing blogs/newsletters, and maintaining web sites. The Native Council of Nova Scotia (NCNS) provided an information session on ESSIM to delegates of the 35th Annual General Assembly.

Questionnaire participants were asked how effective they felt the ESSIM SAC was in communicating information to stakeholders and the public about the ESSIM Initiative. 49% of questionnaire participants selected that the ESSIC SAC was somewhat effective in communicating information to stakeholders and the public about the ESSIM Initiative. The written responses to this question revealed that participants would have selected different responses if the question had been separated in two components (i.e., communication to the public vs. communication to stakeholders.

When asked about the general public's level of understanding about the ESSIM Initiative, 46.9% of questionnaire participants selected that, despite the attempts at communication to the public about the ESSIM Initiative, the public has a minimal level of understanding about the Initiative. Most of the SAC evaluation workshop participants also felt that communication to the public was a weakness of the ESSIM Initiative. Some of the participating sectors felt they were effective in communicating within their own stakeholder group but that communications to the general public and other parties outside the process was not very successful. It was noted by some participants that the offshore focus of the Initiative limited its relevance for many coastal communities and other stakeholder groups. It is worth noting that although the general public's level of understanding about the ESSIM Initiative is perceived to be quite low, the Initiative is one of the best known examples of integrated oceans management internationally, as evidenced by its high profile in numerous academic publications (e.g., Rutherford et al. 2005, Foster et al. 2005, Yao 2008).

Finally, the ESSIM SAC initiated a very high level of informal communication and information exchange amongst its members. Workshop participants noted that the SAC was a mechanism for

keeping informed of various regional initiatives, studies, and projects. This was also noted by Flannery and Ó Cinnéide (2012) as a key benefit of the ESSIM SAC to its participants.

3.2.8 Monitoring and reporting are effective and timely

Monitoring within the context of integrated management refers both to the need to monitor progress on the implementation of the Plan and the broader need for monitoring of socio-economic and environmental conditions in the planning area.

Three evaluation questions were used to assess the extent to which the objective "monitoring and reporting are effective and timely" was achieved (Table 20).

Table 20. Evaluation questions and indicators for objective "Monitoring and reporting are effective and timely"

Evaluation Question	Indicator(s)	Assessment	Data Sources
Did a biophysical monitoring system for the ESSIM area exist?	Presence/absence of a document that outlines a biophysical monitoring system for the ESSIM area	**A document exists that outlines a monitoring system for the ESSIM Initiative**	• State of the Scotian Shelf overview report
	Number of theme papers published on the State of the Scotian Shelf web site as of June, 2012	**8**	• State of the Scotian Shelf report
Was information generated from research and monitoring activity in the ESSIM area reported to stakeholders?	Number of times results from research and monitoring were shared at ESSIM SAC meetings from 2009-2011.	**4**	• ESSIM SAC meeting minutes
Was there a mechanism in place to evaluate the implementation of the ESSIM Plan?	Presence/absence of a documented plan in place to evaluate the implementation of the ESSIM Plan	**There was a documented plan in place to evaluate the implementation of the ESSIM Plan**	• ESSIM Evaluation Plan
	Stage of integrated management when evaluation indicators were developed	**Stage 5: Integrated Management Plan**	

As outlined in the ESSIM Plan, numerous monitoring programs are in place on the Scotian Shelf. Probably the most comprehensive of these is the Atlantic Zone Monitoring Program. This

program collects environmental data related to hydrography, climate, plankton abundance, and sea level, amongst other variables. Various other environmental monitoring programs for specific ecosystem components are also ongoing, such as contaminant monitoring, monitoring of fish and marine animal populations, environmental effects monitoring regimes for oil and gas projects, the Nova Scotia State of the Coast Report, and Environment Canada's weather and environmental monitoring programs. In 2010, a compilation of available scientific and technical information on the condition, trends, drivers, and stressors of the Gulf of Maine and Scotian Shelf ecozone was published (Worcester and Parker 2010).

A formal monitoring system for the Scotian Shelf was launched in 2011 with the publication of the State of the Scotian Shelf Report[17]. The report, prepared by OCMD and available on the Coastal and Ocean Information Network (COIN) Atlantic web site (coinatlantic.ca), is intended to be a "living document" with several parts including a context document and a series of theme papers. The report presents a synthesis of pressures on the environment, biophysical, and socio-economic status and trends, and responses to identified issues.

There are a number of ways (particularly inter-departmentally) that research and monitoring results related to the ESSIM area were communicated to decision makers and stakeholders, including the ESSIM Forum workshops, various public talks, and the publication of technical reports. During the eight ESSIM SAC meetings from 2009-2011, research and monitoring results were reported to the SAC a total of four times.

As mentioned previously, in 2006, a contractor prepared a comprehensive document with suggestions on various ways to evaluate the implementation of the ESSIM Plan (Walmsley 2006a). This document was never formalized or adopted for use. An OCMD staff member explained that the report was produced as the ESSIM Plan was being finalized and there was pressure from the sectors to publish the Plan. They indicated that there was a general feeling that "we had to get something out there and get implementing" and that the ESSIM sectors did not want to spend time developing the evaluation system.

In late 2011, a scoping document was drafted that outlined a proposed plan for the current evaluation. This document was subsequently supported by the ESSIM Evaluation Sub-Committee. By late 2011, the ESSIM Initiative was already within Stage 5 of integrated management (Implement the Integrated Management Plan) according to the Policy and Operational Framework for Integrated Management of Estuarine, Coastal, and Marine Environments in Canada. The scoping document did not contain indicators and these were developed a short time later for the Collaborative Governance and Integrated Management objectives. Ideally, the evaluation framework and a suite of indicators for all three of the Plan's goals would have been developed at the same time as the ESSIM Plan.

Attempts were made during the early stages of the ESSIM Initiative to develop indicators for the Human Use and Healthy Ecosystems objectives. A process was undertaken in 2003-2004 to develop indicators for the Human Use objectives of ESSIM (see Walmsley 2005a) but these were never formally adopted for use. Walmsley (2005b) conducted a review of indicators for marine ecosystem-based management. O'Boyle et al. (2004) identified a suite of conceptual

[17] Please see Annex 2 for more information on the State of the Scotian Shelf Report.

conservation objectives for the ESSIM area, based upon a set of national objectives which address biodiversity, productivity and habitat issues. As with the proposed Human Use indicators, these were never formally adopted for use.

Finally, it is important to note that an evaluation of DFO's national Integrated Oceans Management Program was completed in 2012. The main objective of this evaluation was to determine to what extent the Integrated Oceans Management Program is relevant, is managed effectively and efficiently, and whether it has achieved its stated objectives. The evaluation examined the extent to which the Integrated Oceans Management Program demonstrates value for money in its relevance and performance (including effectiveness, efficiency and economy), in accordance with Treasury Board's 2009 Policy on Evaluation.[18]

3.3 Assessment

An assessment of the extent to which the Collaborative Governance and Integrated Management objectives were achieved, based on the assessed indicators above, is provided in Table 21. A scale of 1 to 5 was applied to portray the extent of achievement for each objective. A score of 1 reflects no achievement and a score of 5 reflects full achievement.

[18]The complete evaluation report can be accessed at: http://www.dfo-mpo.gc.ca/ae-ve/evaluations-eng.htm

Table 21. Assessment of extent to which Collaborative Governance and Integrated Management objectives were achieved

Objective	Assessment	Comment
Collaborative structures and processes with adequate capacity, accessible to community members, are established	4/5	The ESSIM Collaborative planning model was fully implemented. New coordination mechanisms were established and stakeholder involvement was facilitated. The capacity and commitment of sectors varied. There was uncertainty about the role/mandate of the ESSIM SAC.
Appropriate legislation, policies, plans, and programs are in place; legal obligations and commitments are fulfilled	3/5	There is a multiplicity of legislation, policies, plans, and programs in place in the ESSIM area. Stakeholders were mostly satisfied with the content of the ESSIM Plan. The Plan was not endorsed by the Minister of Fisheries and Oceans.
Ocean users and regulators are compliant and accountable	No indicators	It was not possible to develop or assess indicators of compliance or accountability. ESSIM-specific frameworks for compliance promotion and performance monitoring, reporting, and assessment were not developed. However, sector-specific compliance and monitoring mechanisms are in place.
Ocean stewardship and best practices are implemented	2/5	Numerous relevant guidelines and best practices are in place in the ESSIM area. However, existing guidelines and best practices were not reviewed and improved/adapted directly through the ESSIM process.
Multi-sectoral resource use conflict is reduced	3/5	Agreed-on procedures and mechanisms for the resolution of conflicts were in place. The relationship building and informal communication that occurred with the functioning of the ESSIM SAC contributed to conflict avoidance. There was no mechanism in place to report resource use conflicts within the ESSIM area to the ESSIM SAC.
Natural and social science research is responsive to knowledge needs	4/5	Numerous scientific outputs were produced related to the ESSIM Initiative. Formal review processes are in place and the results of research have influenced management activities in the ESSIM area. An ESSIM Science working group was established but an ESSIM-specific research strategy was not developed.
Information management and communication are effective	3/5	Information on the ESSIM Initiative is accessible to stakeholders but the public has a minimal level of understanding about the Initiative. ESSIM is one of the best known examples of integrated oceans management internationally.

4. SUSTAINABLE HUMAN USE

This section describes actions or initiatives taken towards the management strategies associated with the ESSIM Plan's Sustainable Human Use objectives (Table 22).

The overall intent of the Sustainable Human Use goal was to ensure that current and future generations continue to receive benefits from and have access to the ocean and its resources. The main focus of the social and cultural well-being element is on sustainable communities and healthy human relationships with the ocean. The objectives emphasize the need for equitable opportunities and access for coastal communities to sustainable livelihoods from the ocean. The economic well-being element addresses the economic benefits that are associated with and derived from ocean resources, including renewable and non-renewable resources. The objectives presented under this element stress the fundamental requirement for sustainability in the use of marine resources and areas.

Table 22. ESSIM Plan's Sustainable Human Use elements and objectives

Element	Objective
Social and cultural well-being	Communities are sustainable.
	Sustainable ocean/community relationships are promoted and facilitated.
	Ocean area is safe, healthy and secure.
Economic well-being	Wealth is generated sustainably from renewable ocean resources.
	Wealth is generated sustainably from non-renewable ocean resources.
	Wealth is generated sustainably from ocean infrastructure.
	Wealth is generated sustainably from ocean-related activities.

4.1 Chronology of Events

Concurrent with advancing development of the ESSIM governance structure and strategic-level Plan, progress was made on understanding human use in the planning area. The first phase of the human use analysis focused on developing an understanding of the ocean users and management regimes that existed in the ESSIM area. In 1999, OCMD completed an internal human use audit outlining the principle ocean activities in the planning area, how they are managed, and some of the key management issues and challenges facing the area, including consideration of existing impacts to the ecosystem. In 2001, the human use audit was followed by a more thorough analysis of the regulatory regimes that governed the primary ocean users of the ESSIM area and how they incorporate ecosystem considerations into their decisions and actions (Coffen-Smout et al. 2001).

In 2004, the federal, provincial, and international regulatory and policy frameworks used to manage the various ocean users of the ESSIM area were reviewed, with overlaps and gaps in regulations being identified (Chao et al. 2004). In 2005, a framework of human use objectives

and indicators for the ESSIM area was proposed, which was intended to provide a foundation for reporting on the success of ESSIM in support of sustainable ocean use in the area (Walmsley 2005a).

The second phase of the human use analysis focused on acquiring geo-spatial information on the various ocean users of the planning area (Hall et al. 2011). In 2005, OCMD released an atlas outlining human use patterns of the Scotian Shelf (Breeze and Horsman 2005). In 2006, behind the scenes, a Geographic Information System-based spatial decision support tool was completed and available internally to OCMD. The tool allows members of OCMD to view and manipulate geo-spatial human use data that are available for the Scotian Shelf, in support of informed decision making in the area. Much of the data is publicly available.

4.2 Review

The following sections are sub-divided according to the Sustainable Human Use objectives. Each section contains examples of actions and initiatives taken towards the objective by the ESSIM sectors. As noted above, the review was completed by drawing on individual sector reports, a DFO synthesis of the sector reports, and an ESSIM SAC performance review that was completed in 2009.

4.2.1 Communities are sustainable

According to the ESSIM Plan, a sustainable community is considered to be one that takes a long-term perspective to safeguard the interests of future generations so that social, cultural, economic, and environmental assets create positive outcomes for its members.

The strategies suggested in the Plan for reaching this objective were:

- Identify and characterize communities
- Identify community assets related to the ESSIM Initiative
- Promote and maintain access to sustainable livelihoods from ocean-related activities
- Enhance ocean-related education, training, and awareness
- Support ocean-related services and infrastructure
- Improve government capacity (including fiscal) to implement social programs
- Involve Aboriginal peoples in planning and development decisions

OCMD staff spent considerable time identifying ESSIM's communities of interest during the early stages of the Initiative. In November 2004, OCMD conducted a series of public workshops in coastal communities after which the community sector representatives, the Coastal Coalition of Nova Scotia and the Coastal Communities Network, were added to ESSIM SAC despite ESSIM's offshore focus (Millar et al. 2004). No examples of identifying community assets related to the ESSIM Initiative were given in the sector reports.

Several of DFO's ongoing programs promote and maintain access to sustainable livelihoods, including the Atlantic Lobster Sustainability Measures Program and the Small Craft Harbours Program. The Aboriginal Fisheries Strategy Program contributes to the operation of an Aboriginal food, social, and ceremonial fishery.

Several ocean-related education, training, and awareness initiatives related to the ESSIM Initiative are described in section 3.2.7. The sector reports highlight several certification and training programs that have been supported or developed in recent years, including a Certificate of Marine Transportation, an International Dangerous Goods Certificate, and a fisheries management workshop with First Nations chiefs and presidents of the Native Councils.

Several ESSIM sectors support ocean-related services and infrastructure in their ongoing programs. For example, DFO provides ongoing support of infrastructure through its Small Crafts Harbours Program. Transport Canada and DFO/Coast Guard provide ongoing support to the marine transportation sector.

No examples were provided in the sector reports of efforts to improve government capacity to implement social programs.

Aboriginal people have been involved in various planning and development decisions related to the ESSIM process. There has been ongoing participation of Aboriginal people in advisory, science, and management meetings for all species that they commercially fish in the ESSIM area. Aboriginal people have participated in the ESSIM Collaborative Governance model, most notably as members of the ESSIM SAC.

4.2.2 Sustainable ocean/community relationships are promoted and facilitated

This objective gives importance to the cultural links that often develop when individuals derive their living from the sea or have grown up in a community along the coast.

The strategies suggested in the Plan for reaching this objective were:

- Recognize and celebrate coastal communities and their connection to the ocean
- Recognize the social and cultural importance of traditional livelihoods
- Recognize and preserve the social and cultural importance of heritage sites (e.g., archaeological sites)
- Promote social impact assessment to inform decision making
- Recognize and affirm intrinsic values that link people, communities, and the environment.
- Ensure community inclusion in ocean planning and decision making

DFO currently provides resource support to events that recognize and celebrate coastal communities and their connection to the ocean, including the Oceans Connections conference series (OCMD staff have attended in the past), Oceans Day, and other festivals and events centred around the ocean. The Government of Nova Scotia is also involved in these events (i.e., Oceans Day). Parks Canada-managed National Parks and National Marine Conservation Areas promote interactions between people and the natural environment. The interaction between people and Sable Island is particularly relevant given the recent process to designate the island as a National Park Reserve. MAPC is also involved in recognizing the connection of communities to the ocean through its participation in Oceans Day activities and the publication of regular newsletters[19].

[19]MAPC's web site is: http://www.mapcorg.ca/

The social and cultural importance of traditional livelihoods is recognized as part of larger-scale initiatives. For example, a DFO Centre of Expertise for Traditional Knowledge and Coastal Management was created in 2007. The importance of traditional livelihoods is also acknowledged in key provincial documents, such as the Nova Scotia State of the Coast Report (CBCL Limited. 2009). The ESSIM Plan suggests that "as the Plan matures and the ESSIM community becomes more familiar, individuals will gain a greater perspective on the importance of the oceans to others." It can be assumed that this did indeed occur to some extent but it is difficult to assess. The participation of community representatives on the SAC enabled a broad and regular distribution of information back to community organizations and communities.

The social and cultural importance of heritage sites (e.g., archaeological sites) is recognized formally. For example, this is done in some federal EAs through the use of social impact assessment. The Government of Nova Scotia is working to preserve coastal and underwater heritage sites through their work on the Heritage Strategy for Nova Scotia (Government of Nova Scotia 2008). The cultural heritage of Sable Island is now recognized and preserved by the designation of the island as a National Park Reserve.

Social impact assessments are used to inform decision making in the ESSIM area. The Comprehensive Study Reports that are prepared as part of the environmental assessment process for oil and gas projects contain socio-economic reviews which investigate the potential project effects on regions and communities. OCMD's efforts in marine spatial planning are used to assess the social impacts of various ocean activities and inform decision making (Hall et al. 2011).

Section 3.2.1 describes how stakeholders were involved in the ESSIM Initiative. The ESSIM SAC in particular was a mechanism for community inclusion in ocean planning and decision making. Specific examples include the drafting of the ESSIM Plan and providing feedback on MPA planning processes. More broadly, federal and provincial legislation provides for public participation in environmental assessments for marine activities.

4.2.3 Ocean area is safe, healthy, and secure

According to the ESSIM Plan, in order to achieve the goal of sustainable human use, it is necessary to ensure that the ocean area is a safe, healthy, and secure environment for humans. Risks to human safety, security, and health could include contaminants in the ocean, munitions dump sites, accidents at sea, severe weather events, or illegal activities, such as smuggling or terrorism.

The strategies suggested in the Plan for reaching this objective were:

- Assess current status and risks and develop plans to address them
- Support ocean-related services, training, and infrastructure for health, safety, and security
- Monitor and manage chemical or biological contamination that could affect humans
- Maintain and enhance integrated surveillance, monitoring, and response system

An overall risk assessment was not completed as part of the ESSIM Initiative. However, DFO and other federal departments are participants in the Regional Environmental Emergencies Team (REET), which is used to respond to environmental incidents that require interdepartmental

coordination. REET supports efforts for determining risks and vulnerabilities to pollution and setting priorities for environmental response. Environment Canada, Natural Resources Canada, and the Government of Nova Scotia are conducting risk assessments related to climate change.

Several initiatives towards supporting ocean-related services, training, and infrastructure for health, safety, and security are in place. The federal government currently administers and oversees key services and infrastructure, including capabilities for search and rescue and marine environmental preparedness and response. Safety training is ongoing in the fisheries, oil and gas, and transportation industries, in compliance with federal and provincial health and safety legislation.

The ESSIM Plan notes that there are several integrated chemical or biological monitoring programs and protocols in the Maritimes Region. The Canadian Shellfish Sanitation Program is an integrated program delivered by Environment Canada, the Canadian Food Inspection Agency (CFIA), and DFO. Transport Canada implements regulations for the Prevention of Pollution from Ships and for Dangerous Chemicals and Pollution Discharge Reporting Regulations. The CNSOPB's framework for environmental effects monitoring is another example.

No examples of maintaining and enhancing an integrated surveillance, monitoring, and response system were noted in the sector reports, however, the ESSIM Plan profiles the establishment of an inter-agency Marine Security Operations Centre (MSOC) and the Joint Rescue Coordination Centre in Halifax for maritime surveillance, monitoring, and response. Surveillance and monitoring of fishing activity in the ESSIM area is ongoing (see 3.2.3). DFO's computer-based compliance monitoring system for regional conservation areas (e.g., Gully MPA, coral closures) uses multiple departmental data sources to display fishing activities. Also noteworthy is the National Aerial Surveillance Program for pollution monitoring managed by Transport Canada and Environment Canada. In addition, OCMD has been working with partners to build regional information on marine activities, including the application of Long Range Identification and Tracking (LRIT) and Automated Identification System (AIS) data for vessel tracking in real time and analysis.

4.2.4 Wealth is generated sustainably from renewable ocean resources, non-renewable ocean resources, ocean infrastructure, and ocean-related activities

Sustainable development refers to "meeting the needs of the current generation, without compromising the needs of future generations." According to the ESSIM Plan, the intention with these four objectives is to ensure that economic activities are carried out in a manner that does not degrade the resource base or environment, and allows for future generations to have similar opportunities.

The strategies suggested in the Plan for reaching this objective were:

- Assess current and potential wealth generating activities and opportunities
- Identify, assess and link to existing policies, plans, and initiatives for sustainable wealth generation/economic development
- Support existing activities and opportunities, and future economic diversification and employment
- Support positive investment environment for ocean-related activities

- Assess constraints and enabling factors for investment (e.g., regulatory environment) and identify changes required
- Identify and implement measures to improve retention of wealth and benefits within coastal and Aboriginal communities in Nova Scotia and Canada
- Support initiatives to maintain or improve economic competitiveness for Nova Scotia
- Balance industrial capacity with resource sustainability
- Support the conservation of natural capital by recognizing, linking to, and working with related ecosystem objectives and strategies
- Recognize, link to and work with key related social and cultural well-being objectives and strategies (e.g., traditional livelihoods)
- Support innovation and research that may contribute to economic well-being

A number of initiatives in the region relate to the assessment of current and potential wealth generating activities and opportunities. In 2001, OCMD published a paper outlining issues, challenges, and opportunities for the ESSIM area that identified a number of economic opportunities (Fisheries and Oceans Canada 2001c). These include a suite of provincial development strategies, such as those for marine renewable energy, coastal management, and aquaculture. In addition, wealth generation activities are profiled in the Nova Scotia State of the Coast Report (CBCL Limited. 2009) and a report on the economic impact of the Nova Scotia Ocean Economy (Gardner Pinfold Consulting Economists Ltd. 2009). DFO's sustainable fisheries framework includes a suite of relevant policies and directives aimed at modernization and economic viability of the fishery.

The sector reports contained several examples of activities/initiatives that have supported existing activities and opportunities and future economic diversification and employment. The fisheries sector has supported and participated in exploratory licences for developing species for further economic diversification within the fishing industry and has supported the MSC certification process. The telecommunications sector report stated that by enabling efficient communications, subsea cables directly impact the well-being of communities in a positive way. In terms of assessing constraints and enabling factors for investment (e.g., regulatory environment) and identifying changes required, the federal partners' report noted that CEAA is undertaking legislative reforms to improve regulatory efficiencies in federal environmental assessments.

In its sector report, the CNSOPB reported that it balances industrial capacity with resource sustainability by "promoting the fair opportunity for Nova Scotian and Canadian interests to participate in offshore projects and ensures the extraction of non-renewable resources is managed so as to prevent waste."

Several examples were provided for supporting innovation and research that may contribute to economic well-being. DFO provides resource support (i.e. funding and/or staff) for research on marine renewable energy. The fisheries sector supports and participates in science research and innovation through the Fishermen and Scientist Research Society (FSRS) and projects and partnerships with the Social Science and Humanities Council of Canada. The oil and gas industry supports research through several funds, including the Environmental Studies Research

Funds, a research fund for the Deep Panuke project, and the Program of Energy Research and Development (PERD).

There were no specific examples provided in the sector reports of supporting a positive investment environment for ocean-related activities or identifying and implementing measures to improve retention of wealth and benefits within coastal and Aboriginal communities in Nova Scotia and Canada. However, from 2000 to 2007, DFO invested almost $600 million in the *Marshall* Response Initiative and reached agreements with 32 of the 34 eligible First Nations. This initiative provided significant support for increased commercial fisheries access and internal governance development.

There were no specific examples provided in the sector reports of:

- Supporting the conservation of natural capital by recognizing, linking to, and working with related ecosystem objectives and strategies
- Recognizing, linking to, and working with key related social and cultural well-being objectives and strategies (e.g., traditional livelihoods)
- Supporting initiatives to maintain or improve economic competitiveness for Nova Scotia

4.3 Summary

Overall, there was moderate to significant progress on some of the management strategies associated with the Sustainable Human Use objectives and limited progress on others. Generally speaking, most ESSIM sectors are continually undertaking activities and initiatives towards the objectives since the objectives are linked to the overall mandates of the federal and provincial governments and the goals of several of the ESSIM sectors (e.g., telecommunications, fisheries, and shipping). In a number of cases, the examples noted in the sector reports were not directed specifically through the ESSIM Initiative, however, it is acknowledged that they are in the spirit of and contribute to the implementation of the Plan. The broad range and scope of the strategies contained in the Plan present a challenge in terms of reporting and performance evaluation.

In general, however, the management strategies that focused on the ESSIM area specifically and would have required targeted resources and multi-sectoral collaboration within ESSIM's collaborative governance framework (e.g., within ESSIM SAC or RCCOM) were not pursued. For example, no examples were provided of conducting a risk-assessment for the ESSIM area or of assessing constraints and enabling factors for investment within a multi-sectoral context.

5. HEALTHY ECOSYSTEMS

This section describes actions or initiatives taken towards the management strategies associated with the ESSIM Plan's Healthy Ecosystems objectives (Table 23).

The overall intent of the Healthy Ecosystems goal was to ensure that the structure, function, and environmental quality of the marine ecosystems associated with the Scotian Shelf are not compromised by our management and use. The Plan recognizes that ecosystems are complex and dynamic and that all of the elements and objectives are interconnected.

Table 23. ESSIM Plan's Healthy Ecosystem elements and objectives

Element	Objective
Communities/ Assemblages	Diversity of benthic, demersal, and pelagic community types is conserved.
Species / Populations	Incidental mortality of all species is within acceptable levels.
	At risk species protected and/or recovered.
	Invasive species introductions are prevented and distribution is reduced.
	Genetic integrity (i.e., genetic fitness and diversity) is conserved.
Primary and Secondary Productivity	Primary productivity and secondary productivity are healthy.
Trophic Structure	Trophic structure is healthy.
Population Productivity	Biomass and productivity of harvested and other species are healthy.
Physical	Physical characteristics of ocean bottom and water column support resident biota.
	Harmful noise levels are reduced to protect resident and migratory species and populations.
	Wastes and debris are reduced.
Chemical	Chemical characteristics of ocean bottom and water column support resident biota.
	Atmospheric pollution from ocean activities is reduced.
Habitat	Habitat integrity is conserved.

5.1 Chronology of Events

In the early 2000s, DFO proposed a path forward for achieving an ecosystem approach to management in the marine environment. The overall objectives of this approach are: 1) do not cause unacceptable reduction in productivity so that components can play their role in the functioning of the ecosystem; 2) do not cause unacceptable reduction in biodiversity in order to preserve the structure and natural resilience of the ecosystem; and 3) do not cause unacceptable

modification to habitat in order to safeguard both physical and chemical properties of the ecosystem (Fisheries and Oceans Canada 2011b). It was envisioned that an ecosystem approach to management would be advanced through ecosystem overview and assessment reports, which are systematic assessment reports that collate and synthesize knowledge of a marine ecosystem's components and functions of a management area and links unique, sensitive, and vulnerable ecosystem components and functions to threshold levels beyond which pressures on the local environment caused by human activities may become detrimental. The threshold levels act as reference points for the management of human activities.

Much effort has focused on the development of ecosystem overviews and the identification of unique, sensitive, and vulnerable ecosystem components and functions in marine management areas. It has been recognized that knowledge of all ecosystem components and functions is unattainable in a practical sense. The resultant approach has been a synthesis of existing knowledge of an ecosystem, coupled with the identification of its ecologically and biologically significant areas (EBSAs), ecologically significant species and community properties (ESSCP), degraded areas, and sensitive and threatened species (Rice et al. 2007). The identification of unique, sensitive, and vulnerable ecosystem components and functions provides the foundation for defining conservation objectives and ecological indicators in each marine management area. To date, however, ecosystem overview and assessment reports have not made significant advancement on the ecosystem assessment component and, in particular, the linkages between ecological indicators, environmental pressures, and ecological reference points (Sadler 2008).

Select references that outline the progress made by DFO regarding the implementation of an ecosystem approach to management of the ESSIM area include:

- Several workshops and reports on developing objectives and indicators for ecosystem-based management (Jamieson and O'Boyle 2001; Walmsley 2005)
- Three workshops to "investigate the unpacking process in support of ecosystem-based management" (O'Boyle and Keizer 2003)
- A paper on operationalizing an ecosystem conservation framework for the Eastern Scotian Shelf (O'Boyle et al. 2004)
- Work on selecting ecologically significant areas (Fisheries and Oceans Canada 2004b)
- Papers on applying an ecosystem approach to integrated management (Rice et al. 2007; Sadler 2008)

The marine environment of the ESSIM area has been well-studied due to its proximity to major oceanographic research centres located in Halifax, Nova Scotia, and other centres located along the northeast Atlantic seaboard (e.g., academic and government oceanographic research institutes). In 2000, a workshop was held in support of ESSIM that consisted of a group of scientific experts to investigate the technical needs of an ecosystem approach to management of the planning area (O'Boyle 2000). The objectives of the workshop were to provide direction regarding an ecosystem approach to management, identify requirements for characterizing the marine ecosystem of the ESSIM area, consider indicators to guide management, and outline monitoring requirements.

To support characterization of the marine ecosystem of the ESSIM area, a review of contaminants on the Scotian Shelf was undertaken by DFO Science in 2001 (Stewart and White

2001). This was followed by a workshop in 2002 on the classification of benthic habitat for the maintenance of ecosystem diversity in the Maritimes Region (Arbour and Kostylev 2002). Also in 2002, the ecological overview of the marine ecosystem in the ESSIM area was released by OCMD (Breeze et al. 2002). In 2003, a state of the Eastern Scotian Shelf ecosystem report was released by DFO Science (Fisheries and Oceans Canada 2003b). The report focused on spatial and temporal trends of biotic, abiotic, and human variables in the ESSIM area.

In 2004, the nature of ecosystem research and reporting began to focus its effort on the application of an ecosystem approach to management in the ESSIM area rather than simply reporting on the state of the ecosystem. For example, deep sea corals were identified in earlier studies as vulnerable ecosystem components located in the ESSIM area. In considering how to manage such sites, a review was undertaken on the restriction of human activities to protect deep sea corals, as observed in other parts of the world (Fisheries and Oceans Canada 2004c).
In 2006 and 2007, a series of documents was released that identified EBSAs of the Scotian Shelf and provided an overview of the implications of the ecosystem dynamics of the Scotian Shelf to management of the ESSIM area (Fisheries and Oceans Canada 2006a, Zwanenburg et al. 2006, den Heyer et al. 2006, Doherty and Horsman 2007).

Over the course of the 10 year period studying the marine ecosystem in the context of ESSIM area (and the Scotian Shelf), much of the geo-spatial data reflected in the many ecosystem publications have been collected and archived in a central database in OCMD. Much of the data are publicly available. To date, these data have supported marine conservation planning in the ESSIM area and the broader Scotian Shelf. In 2009, an atlas of the important habitat for key fish species of the Scotian Shelf was released (Horsman and Shackell 2009). In 2010, as mentioned in section 3.2.8, DFO initiated a comprehensive state of the ocean reporting program for the Scotian Shelf (see Annex 2).

5.2 Review

The following sections are sub-divided according to the Healthy Ecosystems objectives. Each section contains examples of actions and initiatives taken towards the objective by the ESSIM sectors. As noted above, the review was completed by drawing on individual sector reports, a DFO synthesis of the sector reports, and an ESSIM SAC performance review that was completed in 2009.

5.2.1 Diversity of benthic, demersal, and pelagic community types is conserved

A variety of management measures have been implemented in the past to conserve specific benthic, demersal, and pelagic communities and assemblages, or to address specific threats through spatial measures, such as marine protected areas and fisheries closures, as well as non-spatial measures, such as codes of practice for specific ocean activities. With the implementation of the Plan, the intention was to achieve a comprehensive and coordinated approach to the conservation of benthic, demersal, and pelagic communities that will ensure the diversity of community types is conserved.

The strategies suggested in the Plan for reaching this objective were:

- Develop integrated, coordinated conservation framework
- Identify representative, important, and sensitive benthic, demersal, and pelagic (including seabird) communities/assemblages
- Identify threats and management options for conservation
- Implement management measures based on framework

DFO's main emphasis in recent years has been the development of a regional ecosystem approach to management in the marine environment, which is being applied to fisheries management (see 5.1). Linked to the implementation of an ecosystem approach to management has been the participation of relevant federal departments in national marine protected area planning. In 2005, the federal government released a Marine Protected Areas Strategy which outlines its commitment to continue with the development of a network of MPAs. DFO is currently leading the development of a bioregional MPA network. In March 2012, there was a regional Canadian Science Advisory Secretariat (CSAS) meeting to review the data and methodologies for MPA planning and network design. This included the validation of EBSAs and criteria for achieving representation.

A key component of an integrated, coordinated conservation framework is the identification of representative, important, and sensitive benthic, demersal, and pelagic communities and/or assemblages. As noted in the ESSIM Plan, in 2005, DFO initiated a program to identify the EBSAs of the Scotian Shelf (see section 5.1).

Several other examples of identifying representative, important, and sensitive communities and/or assemblages were noted in the sector reports, including:

- DFO and Natural Resources Canada are working on a benthic classification framework that will help to categorize benthic habitats and communities across the Scotian Shelf.
- Parks Canada assessed areas of the Scotian Shelf to identify potential candidates for its National Marine Conservation Areas Programs.
- World Wildlife Fund (WWF) conducted a research program to identify representative communities and highlight priority conservation areas.
- The Spatial Conservation Action Plan, initiated by the ENGO caucus and finalized in 2007, maps known EBSAs and overlays with spatial management measures in place to identify gaps in protection.

The next two strategies ("Identify threats and management options for conservation" and "Implement management measures based on framework") were addressed in conjunction in several cases. For example, as mentioned above, DFO is implementing a policy framework for sensitive benthic areas and an ecosystem approach to management is being applied in IFMPs. The State of the Scotian Shelf Report uses a framework that links pressures from human activities to environmental issues as well as identifies potential management responses (Annex 2). Relevant State of the Scotian Shelf theme papers include "At Risk Species" and "Marine Habitats and Communities". Other federal departments have developed conservation plans which add to the conservation framework. For example, EC has developed a seabird conservation plan for Atlantic Canada. Relevant management measures included an MPA Area of Interest that has

been identified in the St Anns Bank, the Lophelia Coral Conservation Area in the Laurentian Channel, and various fisheries closures.

5.2.2 Incidental mortality of all species is within acceptable levels

A variety of human activities in many different ocean sectors can result in the unintentional mortality of marine species. One of the objectives of the Plan is to keep unintentional mortality within acceptable levels.

The strategies suggested in the Plan for reaching this objective were:

- Quantify the extent of incidental mortality and understand the impact on species/populations
- Identify acceptable levels of incidental mortality for species/populations
- Monitor the catch of non-commercial species in all fisheries
- Identify mechanisms for managing incidental mortality within acceptable levels
- Assess the risks (social and economic) of implementing management measures to address incidental mortality
- Manage human activities to address incidental mortality where practical

Several measures have been taken in recent years to quantify the extent of incidental mortality, understand the impact on species/populations and identify acceptable levels of incidental mortality for species/populations, and monitor the catch of non-commercial species. Incidental mortality is quantified for some species through the fisheries management program, using observers and dockside monitoring. DFO has recently identified by-catch management as a fisheries management priority. For example, the sustainable fisheries framework contains policies related to forage fisheries and by-catch management[20]. As noted in the ESSIM Plan, DFO has also worked with private sector partners to conduct research on the impact of ocean noise on marine fish and invertebrates. For commercial fisheries, IFMPs are the primary mechanism for managing incidental mortality within acceptable levels. In the case of aquatic species at risk, recovery strategy and action plans are used to address this issue (see section 5.2.3). The Canadian Shipping Federation is currently working in collaboration with the Reseau d'observation des mammifères marins to develop an atlas for mariners transiting the North Atlantic that will include information on marine mammal habitats and breeding and feeding patterns.

No examples were provided in the sector reports of assessing the risks (social and economic) of implementing management measures to address incidental mortality. However, for aquatic species at risk, cost benefit analyses are conducted for listing and recovery examples.

Finally, in terms of managing human activities to address incidental mortality where practical, DFO's sector report notes that the department, by developing and implementing IFMPs for fisheries, supports sustainable harvesting practices and a reduction in by-catch. The prevention of incidental mortality is upheld through the conditions that accompany fishery licences.

[20] See http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/fish-ren-peche/sff-cpd/overview-cadre-eng.htm

5.2.3 At risk species protected and/or recovered

As noted in the ESSIM Plan, a number of Canada's native wildlife species are considered to be at risk of extinction or extirpation. Ensuring the protection and, where applicable, promoting the recovery of these species is a national and international priority. To this end, Canada has developed the *Species at Risk Act* (SARA) and a number of complementary programs to promote the recovery and protection of at-risk species. The intention of this objective is to ensure that the integrated management process supports and complements SARA programs.

The strategies suggested in the Plan for reaching this objective were:

- Implement recovery strategies, action, and management plans under the *Species at Risk Act* (SARA)
- Ensure that sectoral management plans and ocean activities are consistent with SARA
- Coordinate multi-species recovery planning where appropriate

A number of recovery strategies, action plans, and critical habitat designations have been developed under SARA. Key species addressed were Leatherback Turtle, North Atlantic Right Whale, Northern Bottlenose Whale, and Atlantic Wolffish.

Several examples were provided in the sector reports of efforts to ensure that sectoral management plans and ocean activities are consistent with SARA. For example, IFMPs have measures for addressing species at risk within commercial fisheries. Under CEAA, environmental assessments for ocean-related activities require adherence to the SARA. In the case of marine transportation, several measures have recently been developed to comply with SARA requirements, such as the designation of an "Area to be Avoided" in the Roseway Basin for North Atlantic Right Whales. Mitigation measures for SARA species are also contained in the *Statement of Canadian Practice with respect to the Mitigation of Seismic Sound in the Marine Environment.*

The only known example of multi-species recovery planning to date has been focused on a common action plan for three species of Wolffish (Northern, Spotted, and Atlantic). Finally, there is a State of the Scotian Shelf theme paper on at risk species (see Annex 2).

5.2.4 Invasive species introductions are prevented and distribution is reduced

Invasive species are a major threat to native diversity, and can also affect fisheries and aquaculture operations. An objective of the Plan is to prevent the introduction of invasive species and to limit their distribution within the planning area.

The strategies suggested in the Plan for reaching this objective were:

- Assess sources, vectors, extent, and risks of invasive species
- Develop management plans and measures to prevent introductions and limit distribution of invasive species
- Establish a surveillance and monitoring system

As indicated in the ESSIM Plan, research to assess the sources, vectors, extent, and risks of invasive species is ongoing. For example, research has begun on the spread of tunicates and the factors that encourage or discourage their introduction. The maritime transportation industry, in

its sector report, notes that the industry has participated in scientific research on sources, vectors, risks, and dissemination patterns of invasive species. There is also a State of the Scotian Shelf theme paper on invasive species (see Annex 2).

The primary advancement in developing management plans and measures to prevent introductions and limit distribution of invasive species was the development of ballast water control and management regulations under the *Canada Shipping Act* (2001). The intention of the regulations is to ensure that oceangoing ships exchange their ballast and flush their tanks at sea, in order to reduce the introduction risk of invasive species in coastal waters or sensitive areas on the Scotian Shelf. Environmental assessments for oil and gas projects also contain relevant mitigation measures to limit distribution of invasive species.

National and regional aquatic invasive species programs have been established by Environment Canada and DFO. These programs are aimed at surveillance, monitoring, and response, as well as research on methods to address impacts.

5.2.5 Genetic integrity is conserved

According to the ESSIM plan, genetic integrity refers to the genetic fitness and diversity of a species or population. The Plan proposes to conserve genetic integrity by improving knowledge and identifying priority species. Once priority species have been identified, management measures should be developed to promote the recovery and/or prevent the loss of genetic diversity within these species if possible.

The strategies suggested in the Plan for reaching this objective were:

- Improve knowledge of genetic integrity and identify priority species
- Develop and implement management measures to conserve genetic integrity where required

There were no examples given in sector reports of relevant actions or initiatives related to this objective. The main area of effort related to this objective has been through SARA and the protection of priority/vulnerable species (see section 5.2.3). The identification of ecologically significant species (ESS) for MPA network planning is another example of a relevant initiative.

5.2.6 Primary productivity and secondary productivity are healthy

Primary and secondary productivity provide the foundation for the food web and are essential to overall ecosystem function. A variety of human and natural factors can affect primary and secondary productivity, resulting in ecosystem impacts.

The strategies suggested in the Plan for reaching this objective were:

- Assess and review factors that influence primary and secondary productivity
- Review, evaluate, and upgrade monitoring programs
- Develop management measures to address negative factors

In terms of assessing and reviewing factors that influence primary and secondary productivity, DFO's Science Branch is currently undertaking research on the potential impacts of climate change, such as ocean acidification.

As noted in the ESSIM Plan, DFO's Atlantic Zonal Monitoring Program (AZMP) is the main mechanism for monitoring primary and secondary productivity in the region[21]. In addition, regional assessments for commercial fish stocks include information on productivity. Two relevant State of the Scotian Shelf theme papers are under development for fish stock status and primary and secondary productivity.

There were no examples provided in the sector reports of specific initiatives to review, evaluate, or upgrade monitoring programs.

5.2.7 Trophic structure is healthy

Trophic structure is a term used to describe the structure of the food web, or in other words, the hierarchy through which organisms derive their nutrients. It has been recognized that activities that affect a species at one level can have impacts that reverberate through to other levels and throughout the food web.

The strategies suggested in the Plan for reaching this objective were:

- Increase knowledge of trophic interactions and human influences and define trophic structure objectives
- Recognize the importance of a healthy trophic structure in sector management plans
- Develop management measures where needed for healthy trophic structure

Some advancements have recently been made which increase knowledge of trophic interactions and human influences and define trophic structure objectives (e.g., Zwanenburg et al. 2006). DFO is undertaking research on ecosystem modelling and trophic structure, and has incorporated related objectives in its regional ecosystem approach to management (EAM) framework. A theme paper on trophic structure was developed as part of the State of the Scotian Shelf Report (see Annex 2). The importance of a healthy trophic structure has been recognized in some sector management plans. The fishing industry considers trophic structure within its IFMPs and DFO has national policies for forage species and by-catch in place.

5.2.8 Biomass and productivity of harvested and other species are healthy

According to the ESSIM Plan, biomass is a measure of the mass of all living things within a community, species, population, or habitat, and productivity is a measure of the amount of biological material produced per unit area per unit time. Biomass and productivity are the core biological indicators of the health of marine ecosystems. In order to achieve the population productivity objective, human activities need to be managed and monitored.

The strategies suggested in the Plan for reaching this objective were:

- Define biomass and productivity objectives
- Support and enhance stock assessment practices and explore effort-based management approaches
- Ensure compliance with established measures and limits

[21] See http://www.meds-sdmm.dfo-mpo.gc.ca/isdm-gdsi/azmp-pmza/index-eng.html

- Identify other important species and develop management measures (e.g., keystone species)

Biomass and productivity objectives are now being documented in IFMPs. Biomass estimates are available for groundfish and large pelagics and there are harvest points in place for snow crab, shrimp, and shelf clam. DFO conducts regular stock assessments and has also established framework assessments that include indicators for monitoring the health and rebuilding assessed stocks. The regional MPA network planning process is also incorporating ESS (commercial and non-commercial) and their important habitats (Fisheries and Oceans Canada 2006b). In terms of ensuring compliance within established measures and limits, the CNSOPB's EEM requirements for oil and gas activities include monitoring and assessment of species composition within related project areas. EEM results are presented according to ecosystem components in an annual reporting mechanism. In the case of commercial fisheries, DFO's compliance and enforcement program includes aerial surveillance, at sea observers, vessel monitoring systems, and dockside monitoring to ensure compliance of all fishing rules and regulations.

5.2.9 Physical characteristics of ocean bottom and water column support resident biota

The characteristics of the water column and ocean bottom play an important role in determining the communities that are found in a given area. Both natural and human induced factors can change the physical characteristics of the water column and ocean bottom, causing either positive or negative impacts on biological communities.

The strategies suggested in the Plan for reaching this objective were:

- Identify and quantify the impacts of physical factors on biota
- Manage human influences to address negative impacts on physical properties

As stated in the Plan, a number of research programs are underway that identify and quantify the impacts of physical factors on the ocean bottom and water column. For example, DFO is assessing the effects of certain fishing gear on benthic habitats and has identified modifications to gear to address negative effects. MSC certified fisheries have conditions in place that require modification of the fishery to reduce its footprint. Fisheries closures are also used to reduce the negative impacts of fishing on the water column and ocean bottom.

DFO Science also undertakes predictive modeling for marine processes (e.g., circulation) and habitat mapping (e.g., the location of eelgrass beds). Efforts are underway to develop a comprehensive habitat classification model that integrates oceanographic and benthic parameters. DFO's Canadian Hydrographic Service (CHS) and Natural Resources Canada also conducts high resolution sea bed mapping. For oil and gas activities, environmental hazards are identified, and the associated risks assessed and then mitigated and managed for both environmental effects and compliance monitoring.

5.2.10 Harmful noise levels are reduced to protect resident and migratory species and populations

Although the exact effects of increased noise on marine organisms remain uncertain, it is believed that excessive sound causes behavioural changes and in some cases physical damage.

The strategies suggested in the Plan for reaching this objective were:

- Improve knowledge of sound and its impacts in the marine environment
- Identify mechanisms for reducing sound in the marine environment
- Identify and quantify acceptable noise levels for species/populations
- Develop management measures for ocean activities to meet acceptable levels

Some advances have been made in recent years which improve knowledge of sound and its impacts in the marine environment. DFO's Centre for Offshore Oil, Gas and Energy Research (COOGER) conducts nation-wide research on environmental impacts related to offshore energy, including significant research efforts related to noise in the ocean. The Offshore Energy Environmental Research Association (OEER) sponsors research related to the noise impacts of offshore energy. Defence Research and Development Canada also conducts research on sound in the marine environment.

The 2007 *Statement of Canadian Practice with respect to the Mitigation of Seismic Sound in the Marine Environment* is the primary management measure in place for controlling noise related to seismic activity[22]. EEM programs for oil and gas production activities also address noise levels.

The Marine Environment Protection Committee of the International Maritime Organization, of which Canada is a member, has also studied the issue of noise from commercial shipping and its adverse impact on marine life in recent years.

A State of the Scotian Shelf theme paper on ocean noise describes the various sources of noise (e.g., shipping, naval operations, energy) and their management responses in the region (see Annex 2).

5.2.11 Wastes and debris are reduced

Discarded wastes and debris in the ocean can pose a significant threat to marine wildlife and the environment.

The strategies suggested in the Plan for reaching this objective were:

- Assess sources and impacts of wastes and debris
- Assess current measures, capabilities, and infrastructure
- Develop and implement measures to limit inputs (e.g., awareness program and compliance promotion)
- Eliminate the intentional discarding of garbage at sea

There were no examples provided in the sector reports of assessing sources and impacts of wastes and debris, however, a State of the Scotian Shelf theme paper on wastes and debris has been prepared (see Annex 2).

There has been progress on assessing current measures, capabilities, and infrastructure. As noted in the ESSIM Plan, Transport Canada reviewed regulations on dumping of wastes and debris in all of Canada's fishing zones and in all waters south of 60 degrees latitude to ensure that they are

[22]See http://www.dfo-mpo.gc.ca/oceans/management-gestion/integratedmanagement-gestionintegree/seismic-sismique/statement-enonce-eng.asp

in compliance with the International Convention for the Prevention of Pollution from Ships (also known as MARPOL).

Several examples were provided in the sector reports of developing and implementing measures to limit the inputs of wastes and debris and to eliminate the intentional discarding of garbage at sea. Under the 1996 Protocol to the International Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, Canada is taking steps to prevent oceans dumping. Transport Canada implements regulations for the Prevention of Pollution from Ships and for Dangerous Chemicals based on international requirements under MARPOL Annex V. The Maritime Fishermen's Union's Clean Oceans Initiative and Ship to Shore Campaign was implemented to educate and encourage fishermen to bring their waste back to shore. The Scotia Fundy Professional Fishermen's Registration and Training Association provides training on waste disposal. For the oil and gas sector, waste disposal is specifically addressed in the CNSOPB's Offshore Waste Treatment Guidelines. Finally, there are offshore oil and gas industry codes of practice in place in relation to waste in the Gully MPA and on Sable Island.

5.2.12 Chemical characteristics of ocean bottom and water column support resident biota
Contaminants can directly affect the health of marine organisms, especially higher level predators and many marine mammals. Chemical contaminants can cause reduced reproductive success, diminished immune response, and delayed development.

The strategies suggested in the Plan for reaching this objective were:

- Identify and quantify the impacts of chemical factors on biota
- Manage human influences to address negative impacts on chemical properties (e.g., toxic chemicals)

In 2001, DFO undertook a comprehensive review of contaminants on the Scotian Shelf (Stewart and White 2001) and continues to monitor select chemical parameters in the ocean. A State of the Scotian Shelf theme paper on ocean acidification has been completed (see Annex 2).

Several guidelines intended to manage human influences to address negative impacts on chemical properties (e.g., toxic chemicals) were referenced in the sector reports including the CNSOPB's Offshore Chemical Selection Guidelines, Canadian Council of Ministers of the Environment (CCME) Environmental Quality Guidelines, and the Federal Contaminated Sites Guidelines. Environmental effects monitoring for oil and gas activities includes components for monitoring contaminants and toxicity. Also relevant are the controls mentioned in section 5.2.11 for discharges of waste from vessels.

5.2.13 Atmospheric pollution from ocean activities is reduced
The marine ecosystem includes not only the waters of the ocean, but also the seabed below and the air above. A variety of activities carried out on the ocean can result in air pollution, including the use of motorized vessels and flaring from oil and gas production.

The strategies suggested in the Plan for reaching this objective were:

- Identify sources and extent of atmospheric pollution from ocean activities
- Develop management measures to meet acceptable levels

Environment Canada has the federal lead for efforts to identify the sources and extent of atmospheric pollution from ocean activities. In 2010, Environment Canada led a Commercial Marine Vessel Emissions Inventory. There is also ongoing monitoring of air quality on Sable Island by the Nova Scotia Department of the Environment and Environment Canada.

New regulations for air pollution consistent with Annex VI of MARPOL were agreed upon at the International Maritime Organisation in 2010 and are scheduled for implementation in late 2012.

5.2.14 Habitat integrity is conserved

One of the Plan's strategies is to develop a coordinated and integrated conservation framework that involves identifying representative, important communities and assemblages, identifying threats and management options, and implementing management measures (see section 5.2.1). The ESSIM Plan suggests that since communities are intrinsically linked to the habitat that they occupy, marine habitat conservation should be incorporated into the conservation framework for communities.

The strategies suggested in the Plan for reaching this objective were:

- Incorporate habitat considerations in the integrated conservation framework
- Identify and conserve rare, important, and representative habitats
- Manage human influences to address negative impacts on habitat

There were numerous examples provided in the sector reports of actions/initiatives towards this objective. For example, in 2005, Canada's Federal Marine Protected Areas Strategy was released. DFO, along with other federal and provincial departments, continues to work towards the development of a bioregional network of MPAs. This work was informed by the ESSIM Spatial Conservation Action Plan developed in 2007.

Significant progress has been made on identifying rare, important, and representative habitats in recent years. As noted in section 5.1, DFO has made significant progress in identifying EBSAs of the Scotian Shelf. Other relevant efforts include species at risk critical habitat identification and benthic mapping and characterization by DFO and Natural Resource Canada. Environment Canada continues to identify habitats of importance to marine and coastal migratory birds and species at risk.

Several examples of efforts to conserve habitat and to manage human influences to address negative impacts on habitat were noted in the sector reports. These include the St Anns Bank AOI process, the implementation of the Coral Conservation Plan, fisheries closures and gear type restrictions, ongoing management the Gully MPA, and the designation of the Sable Island National Park Reserve.

DFO's Habitat Management Program responds to development proposals to implement the habitat provisions of the *Fisheries Act* and to ensure adherence to the *Species at Risk Act*.

5.3 Summary

As with the Sustainable Human Use objectives, there has been moderate to significant progress on some of the management strategies associated with the Healthy Ecosystems objectives and limited progress on others. Generally speaking, most ESSIM sectors are continually undertaking activities and initiatives towards the objectives. Although in most cases these activities were not directed specifically through the ESSIM Initiative, it is acknowledged that they are in the spirit of and contribute to the implementation of the Plan. It should also be noted that a number of the Healthy Ecosystem objectives do not fall directly within the mandate of a number of the ESSIM sectors outside of government.

6. CONCLUSIONS

6.1 Lessons Learned

The main purpose of this evaluation and review was to generate lessons learned from implementing the ESSIM Initiative over the past ten years that can be used in future integrated management efforts in the Maritimes Region and other locations in Canada. The following lessons learned are structured according to themes that emerged during the evaluation and review process as well as specific discussions held at the evaluation workshop.

6.1.1 Boundaries

Although the 2002 Policy and Operational Framework for Integrated Management of Estuarine, Coastal and Marine Environments in Canada included Coastal Management Areas, the ESSIM Planning Area was limited in geographic scope to the Eastern Scotian Shelf and did not include the coastal regions of Nova Scotia. Throughout the duration of the ESSIM Initiative there was speculation that the ESSIM area would eventually be expanded to include the whole Scotian Shelf and possibly associated coastal areas but this did not occur.

The results of this evaluation and review suggest that the boundaries of an integrated management initiative play a strong role in determining which sectors participate. According to some evaluation participants, in the case of the ESSIM Initiative, the exclusion of the coastal zone meant that placed-based coastal communities had difficulty seeing how the Initiative affected them directly. Integrated management is not a well understood concept outside of its community of practice. Sectors need tangible reasons to participate in integrated management initiatives and many do not have the capacity to participate if they do not perceive that the implementation of the integrated management initiative would directly affect their sector.

6.1.2 Collaborative Planning Model

Based on the evaluation and review of the ESSIM Initiative's Collaborative Governance and Integrated Management objectives, the creation and implementation of the ESSIM Initiative's collaborative planning model can be seen as a success. According to Walmsley and Arbour (2005), ESSIM's collaborative planning model contributed to the establishment of an enthusiastic corps of expertise and personnel that understood the principles of ICOM and the complexity of the processes that are required for implementation. Elements of the model, such as RCCOM, which is confined to the government sector, will continue to operate.

Several lessons have been learned by developing and implementing ESSIM's collaborative planning model. First, all levels of government, departments, and stakeholders need to be involved in integrated management initiatives. It is vital to use or develop governance mechanisms that allow for the full participation of civil society, communities, and NGOs. The exclusion of one or more group, interest, or department significantly weakens the integrated management process.

Second, it is important to use existing governance mechanisms where appropriate and develop new governance mechanisms with different roles at different scales. A broad-based multi-stakeholder body can be a mechanism for building personal relationships, resolving conflicts

between sectors, and exchanging information both formally and informally. The use of this type of mechanism is especially important for engaging with civil society (e.g., community groups) that may not have regular access via other sector-specific mechanisms.

Third, it is important that collaborative governance mechanisms, such as multi-stakeholder bodies, have a clear terms of reference that outlines the group's purpose, objectives, and accountability. If the group is labelled as "advisory," it should be clear to whom it is advisory, for what, and by what mechanisms. The terms of reference for such bodies should address both the development and implementation of an integrated management plan.

6.1.3 Management Plan Drafting and Content

Lessons can also be derived from the process of drafting the ESSIM Plan and its use of strategic objectives and management strategies.

First, the process of drafting an integrated management plan using a multi-stakeholder process is a tangible task with a common goal and can create momentum and enthusiasm for the integrated management initiative. Care should be taken after an integrated management plan is drafted to continue to work on tangible tasks so as not to lose this momentum and enthusiasm.

Second, developing strategic objectives and suggested management strategies, while refraining from including specific actions, timelines, and commitments for implementation, can make it easier to reach agreement between sectors on the Plan. However, this approach can lead to inaction in plan implementation and dwindling support of stakeholders. The drafting of a detailed implementation plan soon after the management plan is finalized is recommended in order to maintain momentum and benefit from the initial senior level political and institutional support and funding that gave rise to the initiative.

Third, the use of strategic objectives in an integrated management plan gives rise to challenges of accountability and evaluation since actions and initiatives may not be directly attributable to the implementation of the integrated management initiative but may still contribute to its strategic objectives. Frameworks for implementation, accountability, and evaluation are important to develop to ensure that strategies set out are actually undertaken.

6.1.4 Management Plan Endorsement

Generally, the non-endorsement of an integrated management plan by decision-makers can be perceived as a lack of commitment and support to the process. Political support of an integrated management plan is important to stakeholders. The perceived lack of support for an initiative can lead to a decline in enthusiasm and commitment to the process by stakeholders and partner departments and a decrease in momentum in plan implementation.

6.1.5 Management Plan Implementation

The experience of the ESSIM Initiative has shown that the shift between the development of an integrated management plan and plan implementation can be difficult, particularly within the context of a strategic-level integrated management plan. As noted above, the drafting of an implementation plan soon after the finalization of the integrated management plan would be a useful exercise.

Within the current context of oceans management in Canada, it is recognized that implementation of oceans management will realistically continue to primarily occur on a sector-by-sector basis. However, effective coordination and a framework for accountability are essential in order to ensure that regional-scale cumulative issues and conflicts are addressed.

6.1.6 Commitment and Capacity

Specific ways to encourage the participation of all sectors in integrated management initiatives have emerged from the results of this evaluation and review:

- The work of the integrated management initiative should be integrated into existing collaborative governance mechanisms. This includes, for example, sector resource management processes.
- It is important to articulate the benefits of participating in the initiative to all sectors at all stages of the process.
- It is vital to make tangible progress in order to keep the interest and commitment of all sectors. Smaller, manageable multi-sectoral projects are good mechanisms for making tangible progress.
- Financial assistance and training may help certain sectors (communities, for example) increase their input and engagement into integrated management initiatives.
- As a means to address varying levels of stakeholder/sector commitment and participation, it would be useful to request that stakeholders, if at all possible, maintain the same representative over time or at least require that representatives new to the process be fully briefed on the initiative, their institutional/sectoral role and the position of their department, agency, or sector vis a vis the initiative.

6.1.7 Decision Making and Conflict Resolution

Flannery and Ó Cinnéide (2012), in their paper on deriving lessons relating to marine spatial planning from the ESSIM Initiative, noted that decision making on the basis of consensus has had significant limitations and indicated that other decision making processes may need to be explored. In contrast, the results of the current evaluation and review suggest that most SAC members were satisfied with this method of decision making even though there were some delays that occurred due to consensus not being reached. Consensus-based decision making can work well in the context of a multi-stakeholder body working towards a common goal (i.e., the development of an integrated management plan). However, it is important to have an agreed-upon alternative mechanism in place in the event that consensus cannot be reached. Furthermore, consensus-based decision making may not be the most effective method of decision making once overall goals and objectives have been agreed upon, particularly where much of the plan implementation is being undertaken by individual sectors or governments.

Robust chairing is vital to keep decision making processes moving along when consensus-based decision making is employed. Within the context of multi-stakeholder bodies, the use of co-chairs and the creation of sub-committees is useful in order to address sector-sector conflict.

6.1.8 Communication

Several different forms of communication and information exchange were used in the ESSIM Initiative ranging from the ESSIM Forum to the ESSIM web site. All were perceived as important by questionnaire and workshop participants.

Good communication between sectors is crucial to the success of integrated management initiatives. Communication networks for integrated management should be transparent and interactive. The development of a communications plan or strategy during the early stages of the initiative would be a worthwhile endeavour.

The success of the ESSIM Forums has shown that large scale integrated management workshops, open to the public, can be good venues to use at the beginning of an integrated management process. These types of events lend themselves to reaching a broad range of stakeholders and engagement in higher level planning.

The experience of the ESSIM SAC has shown that multi-stakeholder governance mechanisms are valuable for both the cross-sectoral relationships that are developed and the informal communication that takes place.

Finally, regular and effective public communication about the integrated management initiative is very important since it enables stakeholders to build public and sectoral support for the initiative. Integrated management initiatives should take advantage of internet-based tools to facilitate participation, collaboration, and information sharing.

6.1.9 Performance Evaluation

The planning and undertaking of this evaluation and review generated some general lessons learned about the performance evaluation of integrated management initiatives.

Performance evaluation is an integral step in the integrated management initiative. A general plan for performance evaluation should be written into the integrated management plan. If possible, is important to formulate agreed-upon, measurable indicators to use in integrated management performance evaluation. The formulation of the indicators takes time and should be embarked on during the early stages of the integrated management process.

6.2 The Future of Integrated Oceans Management in DFO Maritimes Region

Questionnaire and workshop participants articulated their ideas as to what integrated management should look like in DFO Maritimes Region in the future. The following points are intended to be general and have been put forward as guidance for DFO as it determines future directions and priorities for the Oceans Program. This evaluation and review presents an analysis of progress made and lessons learned by implementing the ESSIM Initiative over the past ten years. It is important to draw on these lessons and experiences in designing the next phase of integrated oceans management.

Although the ESSIM Initiative has ended, integrated oceans management in some form will continue. The ESSIM Plan provides high-level goals for integrated oceans management that were developed through several years of discussions with multiple sectors that encompass a broader region. It is recognized that if integrated management is applied on a region-wide basis (as opposed to the Eastern Scotian Shelf), more sectors and stakeholders need to be engaged. However, the broad principles in the Plan itself could be modified to apply to the broader area. It

would also be important to make any such region-wide plan relevant at all scales. Workshop participants did not feel that the drafting of a new region-wide integrated oceans management plan, with new ecosystem objectives and management strategies, would be a useful endeavour.

The ESSIM Initiative as a pilot project provides valuable lessons about stakeholder participation and collaboration for future integrated oceans management efforts in the Maritimes Region. Both questionnaire and workshop participants felt that the use of multi-stakeholder tables should continue in some capacity. There has been a lot of time and energy invested, experience gained, and multi-sectoral relationships developed though the functioning of the ESSIM SAC. Participants had several suggestions for how multi-stakeholder bodies could possibly operate in the future. Suggested options ranged from a formal Ministerial advisory body designated under Section 32 of the *Oceans Act* to a broader based regional advisory body attached to the federal-provincial RCCOM. While no consensus was achieved on the most appropriate structure, there was general agreement among the participants that mechanisms for multi-stakeholder engagement should be considered in future efforts.

Future integrated oceans management in the Maritimes Region should make stronger links to multi-sectoral processes currently in place. Integrated management should not only be a DFO-driven initiative and should fully involve all oceans-related sectors and government agencies. Stakeholder engagement efforts should be coordinated with the Government of Nova Scotia, where appropriate.

Future integrated management efforts in the Maritimes Region should target efforts and solve problems where tangible progress, however small, can be made. The geo-spatial data and information that has been collected and archived through the ESSIM process, as well as the conclusions of ecosystem and sector reports, need to be applied in a proactive manner that anticipate, prevent, and mitigate human-ecosystem and human-human interactions in the region. The findings of this data and the State of the Scotian Shelf process should be used, in discussion with stakeholders, to identify a priority list of issues that integrated oceans management can advance over the coming years.

Finally, to date, apart from discussion of shared experiences, integrated oceans management initiatives in each LOMA have occurred independently of each other. Future processes should include some level of collaboration and information sharing between and among other integrated oceans management initiatives.

6.3 Conclusion

The ESSIM Initiative was oftentimes cumbersome, time-consuming, and challenging for all involved and change on the water as a result of the Initiative is difficult to attribute in a direct way. In hindsight, many aspects of the Initiative could have been undertaken with more finesse and efficiency.

However, the ESSIM Initiative's integrated and collaborative approach was a worthwhile exercise for both the governance infrastructure that was developed and the significant

institutional learning that occurred. DFO Maritimes Region was in many ways pioneering the development of an integrated oceans management plan and had to learn by doing. A number of initiatives by DFO, other departments, and ESSIM sectors do demonstrate important changes and advancements that can be directly or indirectly connected with the Initiative.

The ESSIM Initiative also appears to have influenced and broadened the perspective of ocean managers and users. A high degree of collaboration and a sense of shared ownership was achieved resulting in the development of lasting relationships between and within sectors. Generally, the ESSIM Initiative was a worthwhile investment of time and money towards future collaboration between governments, sectors, and stakeholders on a range of oceans management issues.

As the ESSIM Initiative pilot project ends and integrated oceans management in DFO Maritimes Region moves forward, efforts should be focused on developing practical governance mechanisms while advancing implementation of the management strategies suggested in the ESSIM Plan on a region-wide scale. It is hoped that the results of this evaluation and review can be used as a basis for planning for this transition.

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8. ANNEXES

1. ESSIM Questionnaire

Eastern Scotian Shelf Integrated Management (ESSIM) Initiative Questionnaire

Introduction

The following survey is part of an ongoing evaluation and review of the Eastern Scotian Shelf Integrated Management (ESSIM) Initiative. There are three main drivers for the review and evaluation:

1) The ESSIM strategic level plan is in its fifth year and is scheduled for a full review.
2) The ESSIM Initiative in its present form is expected to evolve from a pilot LOMA process to become part of a broader marine planning program for the Scotian Shelf/Bay of Fundy bioregion in the first quarter of 2012.
3) As one of the intentions of the Initiative was to learn about integrated management through a 'learning by doing' approach, an evaluation of progress is required to determine lessons learned and identify recommendations for the future.

The ESSIM strategic level plan is in its fifth year and is scheduled for a full review. The ESSIM Initiative in its present form is expected to evolve from a pilot LOMA process to become part of a broader marine planning program for the Scotian Shelf/Bay of Fundy bioregion in the first quarter of 2012. As one of the intentions of the Initiative was to learn about integrated management through a 'learning by doing' approach, an evaluation of progress is required to determine lessons learned and identify recommendations for the future.

This survey has been developed by a sub-committee of the ESSIM SAC that has been set up to design and provide guidance for the review and evaluation. The questions are designed to assess indicators of the ESSIM Initiative's overarching goal of collaborative governance and integrated management as well as the collaborative planning model upon which the ESSIM Initiative has been designed. Key themes of the survey include leadership and commitment, implementation of the ESSIM Plan, involvement of sectors and stakeholders, and the collaborative approach to integrated management.

The information collected will be stored in a manner to protect your anonymity. Note that if you want to ensure anonymity, please leave out any information that might identify you or your organization. Your responses will be summarized and may be quoted in documents that report the evaluation results. Information from this survey will also be used to guide the agenda for a SAC workshop for the review and evaluation process in early February 2012. A full report on the ESSIM review and evaluation will be prepared by March 2012 and made available to the public in the spring.

To complete the survey, please answer the following questions by selecting the answer(s) and/or providing brief written responses. It is not the intent for participants to answer on behalf of their respective sector/interest/organization but based on their individual experiences and perspectives.

Please mail your completed survey to:

Julia McCuaig
Oceans and Coastal Management Division
Ecosystem Management
Maritimes Region, Fisheries and Oceans Canada
Bedford Institute of Oceanography
1 Challenger Dr., PO Box 1006
5th Floor, Polaris Bldg.
Dartmouth, NS, B2Y 4A2

To ensure the anonymity of your response, please do not write a return address on your envelope.

The deadline for submissions is Wednesday, December 21st.

If you have any questions, contact Julia McCuaig at (902) 407-7773 or email Julia.McCuaig@dfo-mpo.gc.ca.

Information About You

1. Please select your affiliation(s):

Government of Canada
Government of Nova Scotia
Government of Newfoundland and Labrador
Offshore Petroleum Board
Municipal Government
Aboriginal Peoples
Commercial Fisheries Industry
Petroleum Industry
Environmental Non-Governmental Organization
Community Group
Academic and Private Sector Research
Transportation Industry
Telecommunications Industry
Tourism Industry
Other (please specify): _____

2. How many years have you been involved with the ESSIM Initiative?

Less than one year
1-3 years
4-6 years
7-9 years
10 years or more

3. Please select the option(s) that apply:

I have attended an ESSIM Forum
I am a current or past member of the Regional Committee on Coastal and Ocean Management (RCCOM) (senior exec. level forum)
I am a current or past member of the RCCOM Coordinating Committee
I am a past member of the Federal-Provincial ESSIM working group
None of the above

4. Please select the option(s) that apply:

I am a current member of the ESSIM Stakeholder Advisory Council
I am a past member of the ESSIM Stakeholder Advisory Council
I have attended ESSIM Stakeholder Advisory Council meetings as an alternate
I have attended ESSIM Stakeholder Advisory Council meetings as an observer
None of the above

ESSIM Stakeholder Advisory Council (SAC)

please proceed to question 9 if you selected "none of the above" for question 4

5. How satisfied are you with the content of the ESSIM SAC meetings?

Not at all satisfied
Somewhat satisfied
Mostly satisfied
Completely satisfied
I don't know

Comments:

6. How satisfied are you with the number of ESSIM SAC meetings held per year?

Not at all satisfied
Somewhat satisfied
Mostly satisfied
Completely satisfied
I don't know

Comments:

7. How satisfied are you with the consensus-based approach that the ESSIM SAC has used?

Not at all satisfied
Somewhat satisfied
Mostly satisfied
Completely satisfied
I don't know

Comments:

8. The current membership composition of the ESSIM Stakeholder Advisory Council is:

Government of Canada: 4 members
Government of Nova Scotia: 3 members
Government of Newfoundland and Labrador: 1 member
Canada-Nova Scotia Offshore Petroleum Board: 1 member
Municipal Government: 2 members
Aboriginal Peoples: 3 members
Commercial Fisheries: 5 members
Oil and Gas: 2 members
Conservation Groups: 3 members
Tourism: 1 member

Community Groups: 2 members
Academic and Private Sector Research: 2 members
Transportation: 1 member
Telecommunications: 1 member

Is the current ESSIM SAC membership composition appropriate for ESSIM's purpose?

The current membership composition of the Advisory Committee is not appropriate, and contains many gaps
The current membership composition of the Advisory Committee is not entirely appropriate, but contains only one or two gaps
The current membership composition is entirely appropriate
I don't know

Identify gaps, if any:

Sector & Stakeholder Involvement

9. Were there sufficient opportunities for stakeholders to be involved in the drafting of the ESSIM Plan?

Not at all sufficient
Somewhat sufficient
Mostly sufficient
Completely sufficient
I don't know

Comments:

10. Are there sufficient opportunities for stakeholders to be involved in the ESSIM Initiative as a whole?'

Not at all sufficient
Somewhat sufficient
Mostly sufficient
Completely sufficient
I don't know

Comments:

11. Do all sectors have the capacity to actively participate in ESSIM?

Yes
No
I don't know

(If no) Which sectors do not have the capacity to actively participate in ESSIM? What are some of the reasons?

12. Do all sectors have the interest to actively participate in ESSIM?

Yes
No
I don't know

(If no) Which sectors do not have the interest to actively participate in ESSIM? What are some of the reasons?

13. How satisfied are you with your participation in the ESSIM Initiative?

Not at all satisfied
Somewhat satisfied
Mostly satisfied
Completely satisfied
I don't know

Comments:

Outreach & Awareness

14. How effective has the ESSIM Stakeholder Advisory Council been in communicating information to stakeholders and the public about the ESSIM Initiative?

Not at all effective
Somewhat effective
Mostly effective
Completely effective
I don't know

Comments:

15. What level of understanding does the public have about the ESSIM Initiative?

A minimal level of understanding
A low level of understanding
A moderate level of understanding
A high level of understanding
I don't know

Comments:

ESSIM Plan & Plan Implementation

The ESSIM Plan was published in 2007. Sector reports were prepared to outline implementation of the ESSIM Plan. The reports describe actions taken by the sectors towards the ESSIM Plan's goals and associated objectives as well as priority actions for the near future.

16. How satisfied are you with the content and structure of the ESSIM Plan?

Not at all satisfied
Somewhat satisfied
Mostly satisfied
Completely satisfied
I don't know

Comments:

17. How satisfied are you with the implementation of the ESSIM Plan?

Not at all satisfied
Somewhat satisfied
Mostly satisfied
Completely satisfied
I don't know

Comments:

18. Has the ESSIM Plan resulted in improved oceans management in the Eastern Scotian Shelf?

Yes
No
I don't know

Comments:

19. Has the ESSIM Plan resulted in measurable change in the biophysical and/or socioeconomic environment of the Eastern Scotian Shelf?

Yes
No
I don't know

Comments:

Leadership & Commitment

The legislative basis for the ESSIM Initiative and ultimately the ESSIM Plan is drawn from Canada's *Oceans Act*:

The Minister, in collaboration with other ministers, boards and agencies of the Government of Canada, with provincial and territorial governments and with affected aboriginal organizations, coastal communities and other persons and bodies, including those bodies established under land claims agreements, shall lead and facilitate the development and implementation of plans for the integrated management of all activities or measures in or affecting estuaries, coastal waters and marine waters that form part of Canada or in which Canada has sovereign rights under international law

20. How effective have the following components of ESSIM's collaborative planning model been in providing leadership for the ESSIM Initiative?

Fisheries and Oceans Canada (Oceans and Coastal Management Division, Maritimes Region)

Not at all effective
Somewhat effective
Mostly effective
Completely effective
I don't know

Fisheries and Oceans Canada (National Capital Region)

Not at all effective
Somewhat effective
Mostly effective
Completely effective
I don't know

Regional Committee on Coastal and Ocean Management (RCCOM)*
*RCCOM is the senior level forum for federal and provincial departments and agencies with ocean related programs

Not at all effective
Somewhat effective
Mostly effective
Completely effective
I don't know

ESSIM Stakeholder Advisory Council (SAC)

Not at all effective
Somewhat effective
Mostly effective
Completely effective
I don't know

The ESSIM Forum

Not at all effective
Somewhat effective
Mostly effective
Completely effective
I don't know

Comments:

21. How committed have the following sectors been to the ESSIM Initiative? Note: "commitment" in this case means engagement, involvement, and the mobilization of resources.

Government of Canada

Not at all committed
Somewhat committed
Mostly committed
Completely committed
I don't know

Government of Nova Scotia

Not at all committed
Somewhat committed
Mostly committed
Completely committed
I don't know

Government of Newfoundland and Labrador

Not at all committed
Somewhat committed
Mostly committed
Completely committed
I don't know

Offshore Petroleum Board
Not at all committed
Somewhat committed
Mostly committed
Completely committed
I don't know

Municipal Government

Not at all committed

Somewhat committed
Mostly committed
Completely committed
I don't know

Aboriginal Peoples

Not at all committed
Somewhat committed
Mostly committed
Completely committed
I don't know

Commercial Fisheries Industry

Not at all committed
Somewhat committed
Mostly committed
Completely committed
I don't know

Petroleum Industry

Not at all committed
Somewhat committed
Mostly committed
Completely committed
I don't know

Environmental Non-Governmental Organization

Not at all committed
Somewhat committed
Mostly committed
Completely committed
I don't know
Community Groups

Not at all committed
Somewhat committed
Mostly committed
Completely committed
I don't know

Academic and Private Sector Research

Not at all committed
Somewhat committed
Mostly committed
Completely committed
I don't know

Transportation Industry

Not at all committed
Somewhat committed
Mostly committed
Completely committed
I don't know

Telecommunications Industry

Not at all committed
Somewhat committed
Mostly committed
Completely committed
I don't know

Tourism Industry

Not at all committed
Somewhat committed
Mostly committed
Completely committed
I don't know

Comments:

22. How effective has the Oceans and Coastal Management Division DFO Maritimes Region been as the facilitator (i.e., planning/administration/coordination) for the ESSIM Initiative?

Not at all effective
Somewhat effective
Mostly effective
Completely effective
I don't know

Comments:

<u>Collaboration & Conflict Resolution</u>

23. How effective has the ESSIM Initiative been in resolving conflicts between users or

stakeholder groups?

Not at all effective
Somewhat effective
Mostly effective
Completely effective
I don't know

Comments:

24. What level of collaboration between different government departments has been achieved as a result of the ESSIM Initiative?

No collaboration has been achieved
A low level of collaboration has been achieved
A moderate level of collaboration has been achieved
A high level of collaboration has been achieved
I don't know

Comments:

25. What level of collaboration between stakeholder groups and/or sectors has been achieved as a result of the ESSIM Initiative?

No collaboration has been achieved
A low level of collaboration has been achieved
A moderate level of collaboration has been achieved
A high level of collaboration has been achieved
I don't know

Comments:

General

26. What have been some of the successes of the ESSIM Initiative?

27. What have been some of the failures of the ESSIM Initiative?

28. Please feel free to provide additional comments about the ESSIM Initiative or this survey:

2. State of the Scotian Shelf Report

On June 8th, 2011 the first components of a State of the Scotian Shelf (SOSS) Report were released. The report aims to provide information on priority issues for the Scotian Shelf that can be used for environmental management, decision-making and education. The SOSS Report was developed with explicit links to the ESSIM Initiative via an Environment Reporting Sub-Committee of the ESSIM SAC which met in 2009 and 2010. This committee was disbanded in early 2010 when a State of the Scotian Shelf committee was formed. The State of the Scotian Shelf Report builds on the work that had been done previously to catalogue the collective understanding of the Scotian Shelf and surrounding coastal areas (e.g., Breeze et al. 2002; Zwanenburg et al. 2006).

The report, published on the Atlantic Coastal Zone Information Steering Committee (ACZISC) website[23], is a modular document made up of a context document and a series of theme papers. *The Scotian Shelf in Context* provides an introduction to the natural and socio-economic environment of the Scotian Shelf (Fisheries and Oceans Canada 2011a). Individual theme papers provide a more in-depth look at specific issues on the Scotian Shelf and include the following (as appropriate):

- A summary of the issue in brief, including how the issue relates to the DPSIR framework;
- Driving forces and pressures;
- Current status and trends;
- Impacts (ecological and socio-economic);
- Actions and responses;
- Indicators, information and data gaps;
- Linkages to other theme papers; and
- Case studies as required.

The status of the theme papers is presented in Table 24. Each of the completed theme papers is available on the COINAtlantic web site.

Table 24. Status of State of the Scotian Shelf theme papers

Theme Paper	**Status as of April 2013**
Marine Habitats and Communities	Completed
Incidental Mortality	Completed
At Risk Species	Completed
Invasive Species	Completed
Primary and Secondary Productivity	Planned
Trophic Structure	Completed
Fish Stock Status and Commercial Fisheries	In Progress
Water and Sediment Quality	Completed
Ocean Noise	Completed
Waste and Debris	Completed
Ocean Acidification	Completed

[23]See COINAtlantic.ca

Theme Paper	Status as of April 2013
Climate Change and its Effects on Ecosystems, Habitat and Biota	Completed
Emerging Issues	Planned

The framework used for the SOSS Report is the driving forces-pressures-state-impacts-response (DPSIR) framework (Figure 3). The DPSIR framework is viewed as providing a systems-analysis view of the relation between the environmental system and the human system (Smeets and Weterings 1999). According to this framework, social and economic developments and natural conditions (driving forces) exert pressure on the environment and, as a consequence, the state of the environment changes. This leads to impacts on human health, ecosystems and materials, which may elicit a societal response that feeds back on all the other elements. The DPSIR framework was developed as an extended cause-effect-response model and the framework is useful in describing the origins and consequences of environmental problems.

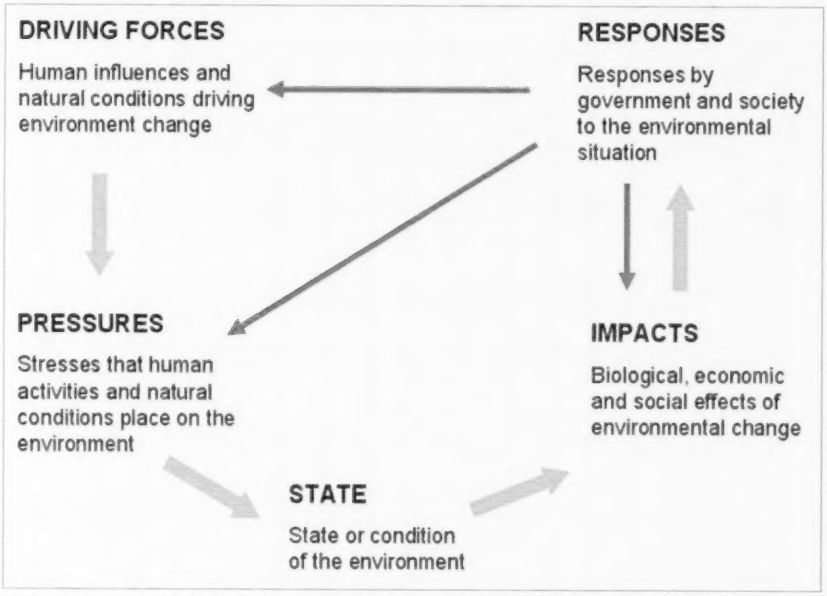
DRIVING FORCES
Human influences and natural conditions driving environment change
RESPONSES
Responses by government and society to the environmental situation
PRESSURES
Stresses that human activities and natural conditions place on the environment
IMPACTS
Biological, economic and social effects of environmental change
STATE
State or condition of the environment

Figure 3. The driving forces-pressures-state-impacts-response framework

The State of the Scotian Shelf Report is an important part of the reporting and evaluation framework for the ESSIM Initiative as it provides a detailed assessment of the extent to which some of the Sustainable Human Use and Healthy Ecosystems objectives have been achieved, and identifies areas where further actions may need to be taken.

The theme papers are not organized directly according to the ESSIM objectives but each paper can be linked to several objectives under all three of the ESSIM Plan's goals, with a strong emphasis on the Healthy Ecosystems component. For example, the theme papers on at risk species and invasive species can be linked to several ESSIM objectives (Table 25).

Table 25. Links between theme papers and ESSIM objectives

Theme Paper	ESSIM Objectives Covered
At Risk Species	Collaborative Governance and Integrated Management ▪ Natural and social science research is responsive to knowledge needs ▪ Information management and communication are effective ▪ Monitoring and reporting are effective and timely Healthy Ecosystems ▪ At risk species are protected and/or recovered ▪ Habitat integrity is conserved ▪ Trophic structure is healthy ▪ Genetic integrity is conserved ▪ Biomass and productivity of harvested and other species are healthy
Marine Invasive Species	Collaborative Governance and Integrated Management ▪ Natural and social science research is responsive to knowledge needs ▪ Monitoring and reporting are effective and timely Healthy Ecosystems ▪ Invasive species introductions are prevented and distribution is reduced ▪ Genetic integrity is conserved

An indicator summary is provided at the end of each theme paper. The summary identifies indicators relevant to the theme paper and the policy issue it represents. The type of indicator is identified (driving force, pressure, state, impact or response) and an assessment of the indicator provided. The general trend of the state of the environment is shown as either a positive trend, a negative trend, an unclear or neutral trend, or no assessment due to lack of data. An overall assessment of the current situation is provided as "good", "fair" or "poor". The indicator summary for the invasive species theme paper is presented in Table 26 as an example.

Table 26. Indicator summary for Invasive Species theme paper

Indicator	Policy Issue	DPSIR	Assessment[1]	Trend[2]
Number of established marine invasive species	Growth in global trade and other human activities	Driving force. Pressure	Poor	-
Distribution and spread of marine invasives	Increase in regional vectors and habitat pressures (i.e., hull fouling. aquaculture. habitat modification. climate change)	Pressure	Fair	-
Losses incurred by fishery and aquaculture industry	Losses of fishery resources from invasive species impacts	State	Poor	-
Costs incurred or spent on invasive species management	Investment in marine invasive management programs and education	State	Fair	-

[1]Assessment: assessment of the current situation in terms of implications for the state of the environment. Categories are poor. fair. good. unknown.

[2]Trend: is it positive or negative in terms of implications for the state of the environment? It is not the direction of the indicator. although it could coincide with the direction of the indicator.

Key:

Negative trend: -

Unclear or neutral trend: /

Positive trend: +

No assessment due to lack of data: ?

Data confidence:

Information on the number of species on the Scotian Shelf was derived from a literature review and represents a very conservative number of marine introductions and invasives.

Species of unknown origin were not included in the review. and it is likely that some of these may have been introduced.

Data gaps:

Large data gaps exist.

For most species addressed in this report. insufficient data exist to describe the abundance. trends and range distribution.

Existing monitoring programs do not address most habitats and taxa. Targeted monitoring programs for marine invasive species in Nova Scotia focus primarily on fouling species and on the European green crab. There is little information on offshore species.

Information on ecosystem and economic impacts is lacking. DFO is currently undertaking a national socio-economic assessment case study of invasive tunicates

It is difficult to make explicit links between the "state" of the biophysical and socio-economic environment of the Scotian Shelf and the management actions that took place as a direct result of the ESSIM Initiative, thus the results of the SOSS Report were not applied directly to the current evaluation and review of the ESSIM Initiative. However, the SOSS Report presents an in-depth look at specific issues on the Scotian Shelf and the "state" of the biophysical and socio-economic environment of the Scotian Shelf. It can be linked to many of the ESSIM Initiative's objectives and provides a baseline for further assessments into the future.